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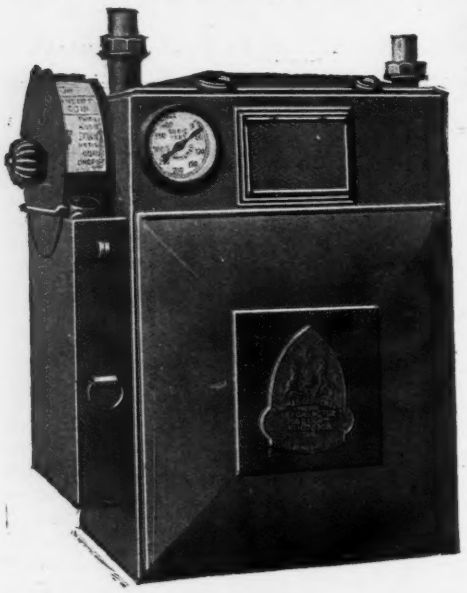

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## EDITORIAL NOTES—GAS, &c.

### The Gaslight Company's Calorific Power Standard.

THE information conveyed through the last two issues of the "JOURNAL," that the Gaslight and Coke Company had accepted a calorific power standard, with penalties, as part of the price to be paid for obtaining their Bill without powerful opposition, has aroused considerable interest in gas circles. The position was discussed last week; and there appears to be general assent that the Company, under the circumstances, made a politic arrangement, though it could have been wished (as pointed out a week since) that the Company's gas was henceforth going to be sold, as has been the case ever since penalty testing was imposed on gas supply, under one standard instead of two. But the agreement that has been made by the Company need not be looked upon with any dismay, though dual penalty testing is involved. The more the matter is considered, the more it becomes clear that the Company have set a precedent that is fair, and is not to the disadvantage of the gas industry. It has not been a case of purely selfish agreement for the attainment of the Company's own ends; it was very distinctly recognized by them that there was a large responsibility in the matter, in that the influence of what was being done would be cast far and wide in the future. The fight for the fullest liberty was carried, it will be seen from our report of the proceedings before Mr. Mooney's Committee last Thursday, right up to the clause stage of the Bill; but, although the final point was not gained, the Company have made it abundantly clear that the terms of the Bill must be regarded for a time as being in the nature of trial ones. Nevertheless, we do look upon the settlement with the London County Council and the City Corporation, as having done much to hasten the time when the illuminating power test, with all its familiar and persistent loopholes for disputation, will become extinct, and a calorific power standard will reign in its stead. Very few gas engineers in these days will be prepared to defend the illuminating power test as against the calorific power test. For, considering the uses to which the bulk of the gas sold is now put, the illuminating power test can only be properly described as a solecism; while in the calorific power test (as was the case once upon a time with the illuminating power test) there is expressed the use to which the great bulk of gas is applied. Test and use harmonize.

However, to the calorific power clause as it now stands in the Bill. It was discussed freely before Mr. Mooney's Committee on Thursday. But only on one point had the Company and the County Council failed to come to a settlement; and to that we will direct attention in its proper position in the sequence of details. As stated last week, the calorific standard is to be 125 calories net per cubic foot of 14-candle power gas, as tested by the "Metropolitan" No. 2 burner; but there is to be no liability incurred in the event of gas being supplied of a calorific power of not more than 10 per cent. below the standard—that is to say, 112½ calories—with a triennial appeal to the Board of Trade if either party desires modification. The figures represent 500 B.Th.U., with no penalty attaching if the returns do not fall below 450 B.Th.U.

In the sub-sections of the clause, the conditions applied to illuminating power testing in the Metropolis have, in a measure, been reproduced. If an examiner finds the heating power is below 112½ calories on any day, he is to make a second test in an interval of not less than an hour; and the average of the two testings is to be taken. Then if the gas on any day is of less calorific power than 112½ calories to an extent not exceeding 6 calories, the average of the testings for calorific power on that day, the day preceding, and the day following is to represent the calorific power of the gas on the day for the purpose of penalty. This is the point—the 6 calories deficiency—on which there was contention. The Company desired that there should be no limitation; but the County Council representatives appeared to have some idea that the Company might have an excessive deficiency on one day, and would be able to make up for it by supplying gas of a high calorific power on the other two days. But, unfortunately for the Company, their power to deliberately make compensation is limited to one day, and is also trammelled by the largeness of their operations, in which conditions there is an abundant protection for the public against the escape of the Company from lapse in their calorific obligations. The calorific history of the "preceding" day will already have been written on the day the deficiency occurs; on the day the deficiency occurs, the Company will not be in a position, the test having ended, to make any amends that will find expression in the official returns for that day; and there is only the third day left on which to bring the average above the 112½ calories. The flexibility of gas supply is not such that the Company can, on the word of command being given, or by any clandestine operation, immediately change from a low to a high estate the calorific value of the gas being distributed.

We quite agree as to the wisdom of the calorific power of a gas supply being maintained as uniform as possible; but there are occasions when, through sudden demands on the Company owing to severe climatic changes and fogs, there might possibly be a lapse. Up to the present time, there has been no complaint, so far as our information goes, from manufacturers or others in regard to the calorific power of the gas sent out by the Company. There is no denying that the object the County Council representatives had in view is a good one; but, having regard to the convenience of the public in having a plentiful supply of gas (they will, of course, have it, calorific power test notwithstanding) when the flights of demand take the consumption temporarily up above the normal height of the season's peak load, the clause might have been left open—anyway, until three years' experience had been recorded. Past experience has not shown that there would be any disadvantage to the consumer by freedom in this respect; and the three days' average of 112½ calories standing without further condition would have been an ample protection for the public. The Committee, however, sided with the County Council; and the 6 calorie limitation is one of the conditions of the test. The penalties are: £5 where the deficiency (under the conditions mentioned above) does not exceed 3 calories; a sum not exceeding £10 where the deficiency is greater than 3 calories, but does not amount to 6 calories; and not less than £25, nor exceeding £100, for each complete 6 calories of deficiency.

These are the conditions applying to the first calorific power standard for penalty testing. The Company have entered into this fresh bond very reluctantly; but it was necessary to remove the jeopardy occasioned by a powerful hostility to their plans and policy. The reluctance was due to the feeling of the Governor and those associated with him that the acceptance of the new standard should have displaced the old one, and that the change should have been made by a General Act and not by a private one. Their action in the matter, under the circumstances of their situation, does not call for any apology.

### Fires—Causes, Known and Unknown.

IF the Bill becomes law that Sir Henry Cotton introduced in the House of Commons yesterday week, and which was then read the first time, it will be a valuable addition to legislation providing for the protection of the public. The Bill proposes that the practice of holding fire inquests, as is now the case in the 673 acres known as the City of London, shall become general. Dr. Waldo, the City Coroner, has strenuously advocated the universal application of the system on all possible occasions, as from his experience in the

City, he is a confirmed believer in the usefulness of such inquests in unearthing the causes of fires and in detecting incendiarism. In the last report of the Chief Officer of the London Fire Brigade (Captain J. de C. Hamilton), as submitted to the Fire Brigade Committee of the London County Council, mention is made of no less than 291 fires the causes of which are returned as unknown; and there were 343 fires in 1907 the origins of which were not discovered. Dr. Waldo and Lieutenant Sladen (one of the Divisional Officers of the Brigade) have made no secret of their belief that electrical installations are the seats of a larger number of fires than is officially attributed to them. Circumstances have been disclosed that give ground for the suspicion that fires are often caused by electricity when no one is about, and on closed premises; and the fire, getting a good hold before being discovered, wipes out the cause of origin. Whether or not there is a fire inquest, this difficulty is a present one, and one that helps to shield electricity. Still the holding of inquiries, conducted systematically by competent men, would no doubt frequently be helpful in directing to this and other causes, now, from superficial examination, classified as unknown. There are also many fires—small, but damaging and disconcerting—caused by electrical installations, that do not come within the cognizance of the Fire Brigade; and private experience in this respect is confirmed by the recent definite statement of Mr. S. G. Castle Russell, the Chief Electrical Engineer of the Phœnix Fire Insurance Company, that not half the electrically-produced fires in this country are reported in the daily papers. There are very few fires occur to which the Fire Brigade is called that do not find publicity in the newspapers; so that those referred to by Mr. Russell are doubtless small ones, to extinguish which the services of the Fire Brigade are not requisitioned, but which occasion no small amount of sensation and alarm in the domestic circle, and end in claims for settlement by the insurance companies concerned. However, if the holding of fire inquests now becomes general, there may be, in the London Fire Brigade reports in future, a diminution in the figures representing fires the causes of which are labelled "unknown."

In one way or another, gas was concerned last year in 366 fires and electricity in 102, within the area of the operations of the London Fire Brigade. If the Grange Road, Bermondsey, explosion be excepted (the initial circumstances producing which were wholly external to the gas distribution system), no fires were produced by gas during the year which it was found necessary to mark as serious; and the only two fires to which Captain Hamilton thought it right to direct special attention in his report were those at the Drury Lane Theatre and on the City and South London Electric Railway. There is no question about the latter having had electrical origin; and all the evidence pointed to the Drury Lane Theatre fire having likewise been due to electricity. In fact, if we turn to the dissection that is made in the report of places and situations of fires, it is seen that theatres and music halls have set against them two fires from defective electric circuits, one from an escape of gas, and three are returned as "unknown." It was certain that an escape of gas was not at the bottom of the fire at Drury Lane; and we think it is fair to assume, recalling the evidence made public in March last year, that this destructive fire accounts for one of the two attributed to defective electric circuits. The fire is stated to have been burning some time before being discovered. While speaking of fires at places of entertainment, the year includes the terrible explosion at the Shepherd's Bush Exhibition, through using an electric fan for pumping hydrogen gas into an air-ship. Under the heading of "exhibitions," two fires are reported as having been due to defective electric circuits, and one to an escape of gas.

In making calculations to ascertain the relation that the 102 electrically-caused fires and the 366 gas-produced fires (irrespective of the particular manner in which the fire was occasioned) has to the numbers of consumers connected with the distribution systems, it must be remembered that the 29 electricity undertakings (whose total consumers are taken) cover a larger district than the London Fire Brigade, and the Brigade operates in a much larger district than the three London Gas Companies. If statistics could be compiled for coterminous areas, the comparison would be worse for electricity and much better for gas than the one about to be made. This year in the "Electrician" tables, we get nearer than ever before to the number of electricity consumers in the areas of the 29 electricity-distributing concerns in London. A year ago only 24 of the undertakings made returns. Now there are 26, leaving only three omissions—the Charing Cross, the County of London, and the Westminster Companies. A pause may be made, to give some interesting figures. A year since, the 24 undertakings had 59,389 consumers; the same concerns now return 64,596 consumers, or an addition of about 5000 spread over the 24. Last year we estimated between 25,000 and 26,000 would about represent the connections of the five concerns not making returns; so giving 85,000 consumers over the large area supplied by the 29 undertakings. The 26 undertakings this year account for 81,356 consumers; so that it may be reckoned 100,000 consumers will cover the 29 undertakings. Twelve months since, we gave the London Gas Companies (with a much smaller aggregate supply area than the 29 electric undertakings) credit for 950,000 consumers. This was then rather above the mark, as at the close of last year their total was about 960,000; and the increase in connections during the year was much above the difference shown. Anyway, it will not be far out one way or the other to assume that, in the area covered by the 29 electricity undertakings, there are 1¼ million gas consumers. Without making deductions for external fires—fires on the distribution systems and outside premises—in which gas or electricity were concerned (the figures would much about balance), the whole of the fires attributed to electricity equal on the total number of consumers for the 29 electricity undertakings 1 to every 980 consumers; and fires caused by gas spread over the consumers of the three London Companies equal 1 in 2623 consumers, or spread over the estimated 1¼ million gas consumers in the areas that are served by the 29 electricity concerns, 1 in 3415 consumers.

We cannot avoid once again making the point that, in the case of the fires caused by the 97 defective electric circuits, the consumers had no means of detecting the defects; while, in the case of the 108 fires occasioned by gas escapes, neglect of the warning that gas gives was mainly responsible for what ensued, Captain Hamilton himself says in his report: "A large number of fires occur from easily preventible "causes; and the public cannot be too frequently reminded "of the dangers arising from carelessness, especially with "matches and naked lights." The fires in some way or another connected with gas (other than the 108 escapes) numbered 258; and no less than 84 of these were due to curtains coming in contact with gas-lights. There were 102 such fires in 1907, so there was a diminution. This reduction suggests that the increasing use of incandescent gas-burners (globe enclosed) in bed-rooms is having an effect in lessening the number of fires from curtains blowing over to naked lights; but it also raises the question whether bedroom brackets are always well placed from the point of view of safety with loose curtains in proximity, though it cannot be disputed that, from the point of view of convenience for the dressing-table, they could not be better situated. The majority of the other fires in which gas was concerned are also of the preventible kind; and their very character suggests carelessness and neglect. Clothes coming in contact with lights and gas-stoves, defective appliances, and seeking for escapes with lights, are causes of fire that cannot find extenuation in any manner of excuse. It is noticed, however, that there were only 15 fires last year caused by the idiotic practice of trying to locate an escape with a light, as against 22 the previous year. It is observed, too, from the analysis of the fires, that no less than 49 occurred in rooms occupied by lodgers; but not one of these fires was serious. This speaks well for the safety of gas, when in poor quarters so few accidents occur. Much has been said lately about cheaper wiring installation; but it is not particularly reassuring to find that at electric light works seven fires were caused by defective electric circuits, and the same number occurred at the establishments of electrical and mechanical engineers, and through the same cause. If there are such occurrences at electricity stations and in electrical engineers' premises, then who can be free from similar mishaps? In contradistinction, at gas-works, only four fires took place—one being due to an escape of gas, two to lights thrown down, and one to a spark from a workman's tool.

Evidence confirmatory of the superior safety of gas is afforded by these statistics year after year. Electricians, with that splendid sophistry for which they have become renowned, say that the ratio of one electrically produced fire to between three and four fires caused by gas (or rather carelessness and negligence) represents the greater safety of electricity. They shun consideration of the greater use of

gas. Presently they will be saying that there is less scope for accident with a million vehicles on the roadways of London than when only 100,000 are scattered over them.

## Foreign Patentees and Revocation.

An industry, which aims at progressiveness in efficiency in the departments of manufacture, distribution, and use, such as the gas industry, must take full advantage of the product of the brains of originators and inventors of all countries; and the large expansion of the gas industry certainly makes it a very inviting one in which to exercise inventive talents and ingenuity. On all hands in the industry, we see the product not only of home inventors, but of those across the seas; and indeed we could not afford to allow insularity or native preference to hinder the use of the best offered, no matter its source. But we are among those who have a strong liking for what Mr. Justice Parker the other day termed "fair play" in connection with the protection and patronage that this country tenders to the foreign patentee; and which "fair play" is of the policy of the Patent Act of 1907. The Act gives to patentees a long period of grace —four years—within which to make the necessary arrangements to manufacture to an "adequate extent" in this country; but several patentees abroad have adopted courses that are preposterous and evasive of the terms on which protection is now granted to their patents. The law of this country, however, declines to be the dupe of craft or deceit. We do not specifically apply this remark to any case that has been heard in connection with the revoking of foreign patents, but recent judicial pronouncement has made the point abundantly clear, and the warning now stands out with excellent and persuasive prominence. The fact, too, is being impressed in a salutary manner by revocation, after full inquiry to ensure equitable decision.

The Comptroller-General of Patents (Sir C. M. Dalton), who has lately been succeeded by Mr. W. Temple Franks, has in recent months revoked several patents that, in his judgment, are being worked "mainly or exclusively" outside, and not to an "adequate extent" in, this country; and though every case must be considered on its merits, the principles guiding in the decided cases, when confirmed by the Court on appeal, must apply to all other exotic inventions that are brought up for revocation, on the charge of being inadequately manufactured here. One case that has produced some authoritative declarations from Mr. Justice Parker as to the meaning and intentions of the Act, is that in which judgment was delivered a few days ago; the appeal having relation to the revocation by the Comptroller-General of a patent for the manufacture of stone slabs and tiles granted to Ludwig Hatschek. The details of the case presented to the Court both for and against revocation have no particular claim on our consideration; the principles that were evolved by it in the judicial statement are the important matters here. There is no question as to the drastic nature of section 27 of the 1907 Act. But the conditions are plainly stated in it on which a patent is granted to an inventor abroad. He has the option of working his invention to an "adequate extent" in this country, or forfeit the patent and the protection, if anyone is sufficiently interested to raise the question. To an "adequate extent" is an open term, the meaning of which can only be determined by considering all the matters applying to cases individually. An attempt was made to get Mr. Justice Parker to put some numerical or proportional interpretation on the term; but he refused to be drawn, and showed the impossibility and unfairness of any definite declaration of the kind that might be hereafter regarded as a precedent and a guide. The policy of the Act, according to his Lordship, being one of "fair play," that is all the country desires from foreign patentees. But the interpretation that some patentees abroad have given to the words of the clause, is not in accord with British traditions and notions of fair play, nor is it in accord with the views of the Comptroller-General and after him Mr. Justice Parker, though we agree with his Lordship that those who make an application for revocation should supply some case requiring answer before the serious step of revocation is taken, otherwise a mere foreign infringer or common informer might set the law in motion.

In the case of Hatschek, the patentee appears to have devoted himself to establishing his industry abroad, and to granting licences to foreign traders to import and sell the goods here; but this is not a fair exercise of rights between this country and foreign countries. Considering, under such a condition of affairs as this, the preference that is shown to the foreign licensees, considering, too, the fact that they have four years in which to establish business relations here and exploit the invention, no British manufacturer would be prepared, at the end of that period, to take from a foreign patentee a licence so handicapped. Nothing at all had been done, in this instance, to conform with the Act. In justification of this abstention, there was no evidence forthcoming of any economic or other cause which would have precluded this new industry being started and carried on here, nor was there any evidence that the profits would have been too small, or that the demand would not have been much greater if the monopoly had been properly exercised. On these grounds, the licence was revoked by the Comptroller-General, and Mr. Justice Parker confirmed the proceeding. There is another case in which the Comptroller-General has revoked a patent; but as this is also to be the subject of an appeal, we will only state the principal ground upon which the decision was arrived at. The Westinghouse Company are the registered proprietors of the Bremer arc lamp patent. In this country between 1905 and 1908, the Company manufactured 1308 lamps, of which 274 remained unsold. In 1906, a licence was granted to Messrs. Koerting and Mathieson, a company manufacturing in Germany; and in this country they are represented by the Union Electric Company. The Westinghouse Company, it is stated, receive a substantial royalty for every lamp imported here. Between 1906 and 1908, 9856 lamps were imported. The patentee contended that the manufacture at Trafford Park, Manchester, was carried on to an adequate extent; but the Comptroller's view was that the manufacture was "mainly" conducted outside this country. In other words, a small manufacture by a patentee in this country does not represent to the Comptroller's mind a proper degree of adequacy, while licensees are manufacturing to a greater extent abroad, and importing the goods to this country. From all which, it is seen that there are patentees who will do all possible to escape the leashes of section 27 of the Act; but the risk run by abuse of the terms on which patents are granted and held is revocation, and an open market in place of the monopoly allowed for several years by compliance.

## "Robbing Gas Consumers."

On London hoardings in letters 18 inches or more deep, and on placards exhibited by the kerb vendors of popular and more or less sensational literature, there appeared last week the words quoted above—attracting the eye of every passing gas consumer, and probably inducing many to part with a penny so as to ascertain whether they were among those who had been subject to the suggested predatory action. "John Bull"—which is conducted by no less a celebrity than Mr. Horatio Bottomley—was the paper making the startling announcement; and it would seem, from the reading of the article, that this paper, which aims at popularity for smartness and choice sensationalism, had been made the channel for giving publicity to a communication from (we suspect) a discharged collector of the Gaslight and Coke Company. There is no doubt a slight framework of truth about the article; but the filling-in is certainly, in the insinuation it conveys, somewhat extravagant. The "robbery" concerned a few prepayment meter consumers; and it was not the work of the Company, nor of any of the superior officials, but of certain prepayment-meter collectors for the sole purpose not, we fain believe, of enriching themselves, but of making their collections conform, without a showing of bad debt, with the meter registration. The imposture practised by these men—there are, we understand, only a few of them, and their operations have been restricted to very narrow limits, and to a class of meters which were designed before the whole range of possible difficulties had been recognized and provided against, but which are being altered as fast as opportunity permits to make such a thing hereafter impossible—has only been recently discovered; and discovery has led to due punitive action from headquarters. "John Bull" candidly confesses that the Directors, the General Manager, and the other highly-placed officials were not in any way cognizant of these wrongful proceedings; but the candour of the editor in this matter would, doubtless, have been much more appreciated if it had also found expression on the London hoardings and on the placards of the kerb vendors of the paper, and if there had not been insinuated complicity in head and cross lines in the article, such as "How a Great Company has

"Mulcted the Poor" and "Politic Blindness"—this being a reference to an assumption that some of the Company's ledger clerks must have been aware of what was happening.

It should be reiterated, for the purpose of emphasizing it, that what has been done by these three or four collectors to (so to speak) save their own skins, is not by any means widespread. The accusation is—and it is not denied that there is ground for it within quite close limits—that, in order to avoid the stigma of bad debts on their districts, arising principally from thefts, these men have been in the habit of altering the price-changing mechanism of a small number of meters that lent themselves to the trick, and, by undersetting, have retrieved monetary loss by ensuring a lessened consumption per coin inserted, until the debts have been wiped out. And this has relieved them of the necessity of reporting the debt to the head office. "John Bull's" informant does not, judging from the article, appear to have dropped into the receptive ear of the writer of the article the fact that this undersetting of prepayment mechanism by a collector is not possible with the majority of slot meters, without breaking a seal which the collector cannot replace, unless, of course, he is supplied with the necessary stamp and sealing wax; and this refers to the types of meters with the price-changer *in situ*. In the change-wheel system, the mechanism cannot be altered to give a consumer more or less gas for his penny, except by the substitution of new change-wheels, which are only obtainable by the Gas Company officially from the makers. It is not to be supposed that Mr. Bottomley, or any other member of his staff, has sufficient technical acquaintance with such meters as to know of these points. As a matter of fact, with the alterations now proceeding as opportunity allows, the meters that are at present susceptible to manipulation of the kind on the part of collectors will, in time, by the conversion, be things of the past. The article also states that other men have been dismissed from the Company's service for, instead of undersetting meters, altering the indices to also avoid showing debt. This is emphatic of the intention of the Company to put a stop to the iniquitous proceedings; but "John Bull" has shown ignorance by, in effect, spreading the suggestion that indices can be generally altered without inflicting some damage. There are indices of meters that have been accessible; but these again are now being provided with a preventive shield. The general experience, however, is that instances of collectors tampering with indices during the many years these slot meters have been in use have been few and far between.

Other minor points are dealt with in the article—such as the so-called "robbery" of ordinary consumers by meters registering fast. One would imagine that "John Bull" is of the opinion that the Company's officials are fully conscious of the fact when consumers' meters are running fast, and registering some trivial amount against the consumers. The Company are not invested with any occult power enabling them to penetrate the action of consumers' meters any more than is the editor of the paper which has given circulation, and perhaps unnecessarily disseminated an amount of mistrust thereby, to the story of presumably an aggrieved collector, suffering the penalty of his misdoings. Regarding the slow and fast working of meters, the editor of the paper in question is apparently not aware that, under the Sale of Gas Act, 1859, no meter is stamped that is more than 2 per cent. in favour of the seller of gas or 3 per cent. in favour of the buyer; nor that of meters taken out of consumers' houses for testing by the statutorily appointed authorities, certainly 50 per cent. are found to be correct, and the balance about equally divided between fast and slow registration. So that the Company do not get the pull out of incorrect registration of consumers' meters that is insinuated in the article. As a matter of fact, of the gas distributed by a gas company, it may be generally taken that they are not paid for more than 95 per cent.; and part of the amount that is unaccounted for is, to the consumers' advantage, due to slow meters.

"John Bull" is supposed to be the embodiment of fair play. He has on this occasion over-reached himself by, as is believed, giving ear to the grievances of one of the discharged men who have been detected committing irregularities so as to preserve themselves from trouble. To the failure of their machinations may be traced the publication in the paper in question. The article is full of oblique hints, suggestive of a greater knowledge by the Company's staff officials, and a greater prevalence of the pernicious system than is true. At any rate, "John Bull," and the public it was desired to agitate, may rest assured that such pernicious procedure as has existed of the kind disclosed in the article has, following the detection of the offenders, already been stamped out. The publicity that has been given to the matter compels some notice being taken of it; for those who are inimical to the interests of the gas industry may be trusted to make the utmost use of disclosure—small though it be. At the same time, other gas undertakings will, by this notice of the matter, make inquiry to see that there are no opportunities for similar wrongdoing on the part of their slot-meter collectors, who are, generally speaking, a trustworthy class of men. It is not, however, a bad practice to periodically change the rounds of the collectors, though this has the effect of interrupting the friendly relationships between the Company's representatives and the customers.

## Laindon's Annual.

The Laindon and District Gaslight, Coke, and Water Company, Limited, has made its annual appearance, in the form of a prospectus and an invitation for more money. The first prospectus came out in April, 1906, the second in June, 1907, the third in July, 1908, and the fourth in March of this year; and not a few of the recipients found the precious documents in their letter-boxes on April 1! This last prospectus is a *rechauffé* of those that have preceded, with a few significant omissions and additions. We will only run lightly over some of the points. The Directors are H. W. L. Way, W. B. Martin, and E. Eaton—Dr. Allan Maclean appears to have dropped out. Barclay and Co. are no longer the bankers; the London Trading Bank, Limited, has taken the place of the firm with such a reputable name in the world of finance. H. P. Davies is still the Secretary. The Directors invite applications for 300 6 per cent. preference shares of £5 each, 300 10 per cent. ordinary shares of £5 each, and 83 5 per cent. first mortgage debentures of £10 each. The holders of the preference shares are to have the right to a *non cumulative* dividend of 6 per cent.; and the holders of the ordinary capital, to 10 per cent. The vendors and contractors have not yet been satisfied, though the Company have been running about four years. The prospectus states that, among other things, the proceeds of this issue are required "on account of balance owing to the vendors and contractors under the contract." The contractors are, it appears, the Water-Works, Lighting, and Power Investment Corporation, Limited, of which Eaton (who is also a Director of the Laindon Company) is a Director. These "contractors" will be glad to get hold of more money; and so will guarantee for the space of two years interest of "at least" 6 per cent. on the preference shares and 7 per cent. on the ordinary shares. Laindon does not seem, according to the prospectus, to be making great headway in development. In March, 1909, it is stated that in the years 1892 to 1896, 2000 plots for building were disposed of, and since 1896 to the present time 7374 plots have been disposed of; but building operations have not taken place so rapidly as would otherwise have been the case in consequence of the want of a proper supply of water and gas. Precisely the same figures and statement have appeared in the Laindon prospectuses since 1906; so that no more plots have been sold, and the building business there is still languishing, notwithstanding the operations of the Company. Other statements in the present prospectus are merely repetitions, with slight modifications, of those in the one circulated last year, and dealt with at the time in our columns. According to the "Financial News," the Water and Gas Debenture and Share Investment Trust, Limited, are in the field offering £3000 6 per cent. fully-paid first mortgage debentures, and the name of Sir Charles B. H. Soame, Bart., Chairman, is made use of for all it is worth.

## Gas and Electricity Supply in Dublin.

It is a matter for regret that Alderman Cotton, the Chairman of the Alliance and Dublin Consumers' Gas Company, had to open his remarks, when moving the adoption of the report at the half-yearly meeting of the Company last Wednesday (the proceedings at which are noticed elsewhere), with a reference to the paragraph announcing a decrease in the consumption of gas in the six months ended Dec. 31, compared with the corresponding period of the year 1907. At the same time, he was able to adduce very good reasons for the deficiency. Depression in

trade, which has adversely affected a number of gas undertakings (and, it may be added, very many others besides), and competitors for lighting and power were the principal causes; and there was no International Exhibition to lead to an unusually large consumption of gas, as was the case in the period with which the past half-year's output was compared. There was a falling-off in both the gas-rental and the receipts for residuals; and coal was dearer by 3s. per ton. These were adverse features in connection with the working. However, the Company have now, as the Chairman put it, "turned the corner," and have entered into contracts for their raw material at a considerable reduction in price. Moreover, the public in Dublin are beginning to appreciate the great advantages to be derived from cooking and heating by gas, as shown by the figures quoted by the Chairman. Though a draft upon the reserve fund to the extent of £9950 was necessary to pay the full dividends of 10 and 7 per cent. per annum, there was left the very substantial balance of £43,255. In addition to this there is a sum of £12,370 in the contingent and suspense account. The confidence of investors in the Company was shown on the occasion of the last sale of shares, when a premium of £12,394 was realized. Contrast this with the position of the electric light undertaking of the Corporation. Already £54,000 has been drawn from the rates to make up for its deficiencies; and they will be saddled with something like £11,000 more this year. There is no prospect of any profit for a long time to come. Meanwhile, the plant is wearing out, and nothing is being set aside for depreciation. Perhaps the ill-will which is being displayed towards the Company by the Corporation, and to which a proprietor referred, is prompted by jealousy. However this may be, the Company can afford to disregard it. The Bill they are promoting will bring them into line with other gas companies in regard to the quality and testing of gas, and will strengthen their financial position by giving them more capital. The proceedings at the meeting passed off satisfactorily; a pleasant feature being the recognition, by an addition to his salary, of the increased responsibility borne by Mr. Francis T. Cotton, the Company's able Secretary and Manager.

### Municipal Undertakings and the Question of the Rates.

It is stated that owing to a drop in the receipts of the Ship Canal and to the growing demands of the Education Committee, a substantial increase in the Manchester rates for the coming financial year is regarded as inevitable. This is bad news for the citizens; but the worst point about it, of course, is that it comes just at a time when, owing to the severe trade depression from which the country is suffering, any additional burden will fall with greater heaviness on the shoulders of those who have to bear it than would be the case in a period of greater prosperity. In view of this unsatisfactory outlook, a deputation from the local Chamber of Commerce waited upon the Lord Mayor of Manchester last week, and represented to him that "the time had arrived when a fair restraint should be exercised in embarking upon any new municipal undertakings involving a heavy outlay and a consequent increase in the already oppressive city rates." It was pointed out that, from all appearances, the local commerce had to face a period of very lean years; that an increase in State taxation was inevitable; and that any serious additional charge on the city rates simultaneously must necessarily tend to check the development of existing industries and to restrain the initiation of any new enterprise. In his reply, the Lord Mayor admitted the truth of this argument; and said it was the general desire of the Council that economy should be practised. Touching upon the trading undertakings, he pointed out that, "with the exception of a very few things," the expenses were covered by the revenue; and in a great many instances there was a surplus besides. The concerns occupying the latter happy position were given as gas, electricity, tramways, and markets. Those undertakings on which there had been a loss, he said, ought to be regarded from the inside. Of course, there is some fairness in this; for it may well be that in certain directions municipalities feel themselves bound to embark upon schemes irrespective of any question of profit. This argument is one, however, that cannot be applied to all concerns. Among the instances of losses cited by the Lord Mayor were the cold-air stores, which were started for the benefit of the tenants of the different markets and of the abattoirs. But just as the Corporation had finished the scheme, there came along an opponent, "with the result that prices had to be reduced all round." The Campfield Market also did not pay; "but it was a very difficult problem to get quit of an undertaking like that." These are two examples that would seem to point a moral; and it is fair to assume that they illustrate the kind of undertakings with regard to which the deputation prayed that fair restraint should be exercised in embarking on further risks. Doubtless the Lord Mayor was correct in saying the Corporation could not help the Ship Canal's decrease in receipts; but the unfortunate point with a concern of this character is that the failing off comes, as already remarked, just at the time (during trade depression) when such a result is least able to be borne by the citizens. To the Lord Mayor's final remark to the deputation: "You must bear in mind that people are always clamouring for something more—for new libraries, new baths, new parks, or something else"—a very simple answer will suggest itself to many people, particularly much-harassed ratepayers.

## THE LIVESEY MEMORIAL FUND.

We have received from Mr. Walter T. Dunn the following list of further contributions to the fund:—

| 1909. | | £ | s. | d. |
|---|---|---|---|---|
| March 29 | Amount already acknowledged . . | 8877 | 1 | 1 |
| 30 | Exeter Gaslight and Coke Company | 25 | 0 | 0 |
| | William Ford, Stockton-on-Tees . | 5 | 5 | 0 |
| | William Langford, Longton . . | 2 | 2 | 0 |
| | Longton Corporation Gas and Electricity Committee . . . . . | 2 | 2 | 0 |
| | Luton Gas Company . . . . . | 21 | 0 | 0 |
| | Midland Gas Managers' Association | 40 | 0 | 0 |
| April 2 | Vernon Harston, Norwich. . . . | 0 | 10 | 6 |
| | Uxbridge Gas Company . . . . | 25 | 0 | 0 |
| " 3 | Doncaster Corporation Gas Committee . . . . . | 10 | 10 | 0 |
| | P. C. Holmes Hunt, Melbourne. . | 5 | 0 | 0 |
| | W. E. Price, Hampton Court . . | 2 | 2 | 0 |
| | F. J. Ward, Knowle. . . . . | 1 | 0 | 0 |
| " 5 | Dr. Jamieson B. Hurry, Reading . | 1 | 1 | 0 |
| | Daniel Irving, Bristol . . . . . | 2 | 2 | 0 |
| | Total . . . . . | £9019 | 15 | 7 |

### Hydraulic Coke-Pusher and Charging-Machines.

The patent hydraulic coke-pusher put on the market about two years ago is now being extensively adopted in leading gas-works in place of the old-style drawing-machine. This pusher is the joint invention of Messrs. Hunter and Barnett, of the South Metropolitan Gas Company, and is manufactured by Messrs. Sir William Arrol and Co., Limited. During the past twelve months, no less than six of these machines have been installed at the Gaslight and Coke Company's various works; and the orders in hand include a trial one for the Windsor Street works of the Birmingham Corporation. Numbers of the machines are at present in operation at the South Metropolitan Gas Company's different stations. The coke-pusher, as is well known, is capable of clearing retorts at one operation, and is suitable for retorts up to five tiers high. During the year 1908, Sir William Arrol and Co. executed orders for a number of their well-known hydraulic charging machines—among others, several for the South Metropolitan Gas Company and also for abroad.

**Informal Meeting of Scottish Gas Managers.**—We learn from Mr. W. B. M'Lusky, of Perth, the Convener, that the Twenty-Sixth Annual Informal Meeting of Scottish Gas Managers will be held in the Alexandra Hotel, Bath Street, Glasgow, to-morrow, under the presidency of Mr. David Vass, of Airdrie. Before the meeting, which is fixed for one o'clock, there will be a conference of the subscribers to the M'Gilchrist Memorial Fund, to arrange for the inauguration of the medal.

**German Association of Gas and Water Engineers.**—It is announced that this year's general meeting of the Association will be held at Frankfort-on-the-Main from Monday, June 21, to Friday, June 25. The Association thus meets to celebrate its jubilee in the city in which it was founded, in May, 1859. The customary assembly and reception will take place on the evening of the Monday; the next three days will be devoted to the technical proceedings; and the Friday to an excursion. The detailed programme will be issued later.

**Monazite in the Antarctic Regions.**—The discovery of monazite in the Antarctic regions by Lieutenant Shackleton's party, of whose approach to the South Pole an account has just been published, is of more than usual interest, in view of the importance of this mineral in connection with the manufacture of gas-mantles. As is pointed out in the Engineering Supplement to "The Times," if important sources of monazite other than Brazil are found, and the extraction of the rare earths is undertaken by independent manufacturers, the incandescent mantle industry will be relieved of much anxiety; since at the present day it is almost entirely dependent upon the German supply of the earths.

## OBITUARY.

### JAMES SOPHRON EMILE DRORY.

It is with much regret that we record the death of Mr. James Sophron Emile Drory, the Chief Engineer of the Aix-la-Chapelle Station of the Imperial Continental Gas Association, which took place last Wednesday from pneumonia following upon an attack of influenza. The sad event occurred with some suddenness; for as late as the end of the preceding week Mr. R. W. Wilson, the Secretary, received a letter stating that Mr. Drory and his wife hoped to be at the dinner in London which it had been arranged should follow the meeting of the Association next month. The next news that came to hand was that he was very ill; and this was followed on Thursday by the intimation that he had died the previous night. The station is just about to undergo complete transformation into a thoroughly up-to-date works, with vertical retorts and all the latest appliances; and in view of Mr. Drory's known keenness and enthusiasm, and of the terrible weather that has lately been experienced at Aix-la-Chapelle, it is conjectured that he may have caught cold while standing about looking after the levelling of the ground and so on. It seems particularly hard that he should have been thus cut off just at the time when he was entering upon the scheme of modernization of the works upon which he had set his heart. Mr. Drory, of course, was one of a family whose name has been connected with the Association ever since the year 1825. That is to say, he was one of eight brothers who have been in the Association's service, and of whom there are now only two left—the second eldest of the family, Mr. W. W. Drory, who is the Chief Engineer at Frankfort-on-Main, and Mr. Alfred Drory, head of the Association's Meter Works at Mariendorf. Mr. James Drory was born in 1850, and entered the service of the Association at Lille, at the age of 17, as a pupil. Some years later he was removed from Lille, and was appointed Assistant Eugineer at Brussels, where he remained from 1873 to 1875; and after that he was made Assistant to his brother Leonard at Berlin, and stayed there until 1887. In that year, on the death of the then Engineer, Mr. Drory was sent to Aix-la-Chapelle to take charge of the station; and there he remained. It is a curious coincidence that he joined the Association on April 1, 1867, and died on March 31, 1909, after exactly forty-two years' service. The only members of the Drory family that the Association still have with them are Mr. William Drory, at Frankfort, who is in his fifty-third year of service, his son, Dr. Drory, who is engaged with him, and Mr. Alfred Drory. As to Mr. James Drory's personal attributes, those who were fortunate enough to know him will not need to be told he was a man of a most charming disposition. At the meetings of the German Association of Gas Engineers, he always set himself to assiduously look after any Englishmen present—showing them about, and generally making himself extremely amiable and most useful. Naturally, he enjoyed the utmost popularity among his colleagues, who keenly feel the loss they have sustained. Their deep sympathy also, and ours, is with Mrs. Drory in the terrible bereavement she has sustained.

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The death occurred last Sunday, at Wilton Park, Beaconsfield, of Sarah, wife of Sir John Aird, Bart. The deceased lady, who was married to Sir John in 1855, had been ill for some time; and, as many of our readers are aware, her husband himself is lying in a serious condition.

Mr. George Malam, the Gas Engineer and Manager to the Corporation of Dumfries, died there on Thursday last, as the result of an attack of erysipelas. Mr. Malam was fifty-two years of age. He is survived by a widow (his second wife), a son, and four daughters. His father, a native of Yorkshire, was appointed Manager of the Dumfries Gas-Works in 1850. In 1878, the gas undertaking was acquired by the Corporation. The deceased succeeded his father as Manager in 1894. Since then the gas-works have been almost entirely reconstructed; and they are at present in a thoroughly up-to-date condition. Two gasholders were erected in Mr. Malam's time—one in 1885, the other three years ago. A year and a half ago sulphate plant was laid down under his direction; and he was complimented upon it by the Government Inspector. Tidings of Mr. Malam's death reached the Town Council while that body was in session; and kindly references were made by Provost Lennon and Bailie Thomson, Convener of the Gas Committee—the former remarking that they all knew Mr. Malam as a capable and energetic Manager.

## PERSONAL.

Mr. William Cash, who has for the past eighteen years acted as Secretary of the Bournemouth Gas and Water Company, has resigned this position. His resignation was accepted by the Board; and Mr. Herbert A. Plumb, his partner, has been appointed Secretary of the Company in his place.

Mr. Christopher Sainty, Manager of the Corporation Water-Works, who is the oldest Corporation official in Windsor, completed his thirty years' service under the Council of the town on Saturday. He went to Windsor as Manager of the sewage works in 1879; and when the water-works were acquired by the Corporation in 1885, he became Manager, and has retained the post ever since. In 1887, he celebrated his silver wedding. During his connection with the Royal Borough, he has won the esteem of all who have come in contact with him.

We are pleased to learn that Mr. D. Milne Watson, the General Manager of the Gaslight and Coke Company, has been selected to fill the position on the Board of the Brentford Gas Company rendered vacant by the death of Mr. Howard Charles Ward. In view of Mr. Watson's long experience with the Company in the management of which he has so large a share, and of its close connection with the one whose directorate he has now joined, we cannot but regard the appointment as other than a very good one; and we cordially wish him every success in his extended field of labour.

Congratulations to Mr. Thomas Berridge, the Engineer and Secretary of the Leamington Priors Gas Company, whose name has been placed on the Commission of the Peace for the borough. Mr. Berridge went to Leamington eleven years ago; and prior to that he was for eight years Manager of the Litchurch Gas-Works, Derby. He was articled to Mr. Chas. Taylor, M.Inst.C.E., Engineer to the Derby Gas-Works. Mr. Berridge is Secretary of the Town Improvement Association, a member of the Committee of the Warneford Hospital, and of the House and Finance Sub-Committees thereof. He is also a member of the Education Committee, and of the Higher Education and Elementary Sub-Committees. He is Chairman of the Chamber of Trade.

It has already been mentioned in the "Journal" that Mr. Alexander Bell is relinquishing his position as Manager of the Dalkeith Gas Company. Mr. Bell first went to the town at the age of 13, to serve an apprenticeship to the plumbing business. He there made himself familiar with the gas-works, and was eventually appointed to superintend the erection of those of the Bonnyrigg and Lasswade Gas Company. He was then for eighteen years at Gibraltar, where he largely reconstructed the gas-works. Returning to Scotland, he was appointed Assistant to the late Mr. William Young, who was building the extensive oil-works at Pentland; and when Mr. Young became Consulting Engineer, Mr. Bell was left to supervise the works. Nineteen years ago, he succeeded Mr. John Young as Gas Manager at Dalkeith. Since then many changes have been made; the works having been partly renewed on more up-to-date methods. Mr. Bell, who has all along taken great interest in his work, has during the latter portion of his professional career come to be regarded as an authority on the use of oil for enrichment purposes. He was President of the North British Association of Gas Managers in 1897.

In a report to be presented at the meeting of the Keighley Town Council to-day, the Gas Committee state that they have received a request from Mr. John Laycock, their Engineer and Manager, to be allowed to retire from the position he has held for 42 years; and it is with considerable regret that they have to recommend that such resignation be accepted, and that his engagement be terminated on June 30 next. They, however, recommend that he be engaged as Consulting Engineer for five years, at a salary of £150 per annum, to be afterwards terminable by three months' notice from either party. The Committee further recommend that Mr. William Baillie, the present Assistant, be appointed Engineer and Manager on probation for twelve months, at a salary of £200; and that the Committee be empowered to renew the appointment at the end of this period, at a salary of £225, increasing by annual increments of £25 to £300 per annum, such appointments to be determinable by three months' notice. It was in 1860 that Mr. Laycock entered the gas-works office as a youth; and seven years later he had reached the position of Manager. In the meantime, he had been away to Bingley for a couple of years. Some particulars of the progress of the Keighley Gas-Works under Mr. Laycock's supervision will be found in our news columns to-day.

At the Queen's Restaurant, Ipswich, last Wednesday, there was a large gathering of the staff of the Ipswich Gas Company, under the chairmanship of Mr. J. T. Jolliffe, the Engineer, Manager, and Secretary, for the purpose of bidding farewell to Mr. Walter Parker, who has been in the service of the Company for fifty years. The occasion was celebrated by a dinner. After the toast of "Success to the Ipswich Gas Company," proposed by Mr. F. Prentice, the Works Manager, and responded to by Mr. F. Corder, a Director, had been honoured, Mr. H. Miller, another member of the Board, on behalf of the Directors and the staff, made a presentation to Mr. Parker. Doing so, he acknowledged the excellent service Mr. Parker had rendered to the Company during his fifty years' connection with it, and said the testimonial, which took the form of a handsome aneroid barometer, was an indication of the good feeling he had inspired among all who had been associated with him. Mr. W. A. Garrard also handed Mr. Parker a solid silver cigar-case; explaining that it had been purchased with the money left in hand after the principal gift had been obtained. Mr. Parker, in acknowledging the gifts, briefly sketched his career. Entering the service of the Company in 1859 as an apprentice, he passed into the office staff, and was appointed collector in 1883. The first slot-meter was fixed in 1892, and now there were 10,500 of them; while the number of ordinary consumers was 4425. "The Health of the Chairman" having been cordially honoured, Mr. Jolliffe, in responding, said he was proud of having been instrumental in starting the superannuation fund, and congratulated the members of the staff on its sound position; there being a sum of £6000 invested.

## RETIREMENT OF MR. HENRY MORLEY.

THE numerous friends that Mr. Henry Morley, the Engineer and Manager of the Cardiff Gas Company, has made during his lengthy career in the gas industry will learn with regret that, in consequence of failing health, he has decided to resign his position. About five years ago, he suffered from a serious illness; and he is in fear that any overstrain of work may bring on a repetition of the trouble. The resignation was accepted last Wednesday by the Directors of the Company, who exceedingly regret the step he has been compelled to take; and he will relinquish his appointment about the end of June, when he hopes to take up his residence in South Devon. Into his well-earned retirement, he will take with him the best wishes of his colleagues (who will greatly miss his advice and able assistance), and of all others who know him.

Mr. Morley has occupied his present post for twenty-seven years; having succeeded the late Alderman Bowen in 1882. Before that he spent six years as Assistant Engineer at the Salford Corporation Gas-Works. Born in Manchester in May, 1847, he is now close upon 62 years old. He is the son of Mr. Charles Morley, for many years Inspecting Engineer for the Manchester and Liverpool section of the London and North-Western Railway. It was in Manchester he was educated, and subsequently (in 1861) articled to Messrs. Walter Mabon and Co., Gas Engineers. His name is to be found among the members of the Institution of Civil Engineers. Mr. Morley has been a quiet, but a thorough, worker. He has, of course, seen great changes in the business carried on by the Cardiff Gas Company, who have latterly made very rapid strides; the increase in the sale of gas last year having been nearly 7 per cent. The population has grown enormously during Mr. Morley's time at Cardiff; and, owing partly to the laying of mains in new areas, the increase in the number of consumers has been even greater in proportion. The make of gas has increased several times over; the output now amounting to about 1200 millions per annum, while there are 30,000 consumers.

Needless to say, this development in business has necessitated vast changes and extensions of the plant for the production of gas. It is less than two years (Oct. 15, 1907) since, in an article entitled "New Methods and Plant at Cardiff," we described a large installation of West's stoking machinery and coke-handling plant, which had just been completed at the Grangetown works, in accordance with a scheme propounded by Mr. Morley. It was shown there that in the twenty years between 1887 and 1906 the quantity of coal carbonized had gone up from 48,632 tons to 97,053 tons; while the gas made had increased from 470,991,000 cubic feet to 1,012,677,000 cubic feet. While therefore the coal carbonized was only 99·57 per cent. more, the make of gas had increased by no less than 115·09 per cent. Mr. Morley had an excellent opportunity—of which he made the best possible use—of proving his skill as an architect in the designing of the handsome offices which were erected on part of the site of the old works at Bute Terrace. These offices are the admiration of all who see them; and they will be a lasting credit to their designer as well as to the Company who occupy them. Since 1907, nothing of an important character in the way of constructional work has been undertaken, except that the Company have inaugurated a complete installation of Messrs. S. Cutler and Sons' carburetted water-gas plant, capable of producing 2 million cubic feet per day. At the present time, Messrs. Willey and Co., of Exeter, have a contract to erect six 40 feet luteless purifiers.

Mr. George Clarry, the Secretary of the Company, who has been appointed to the position of General Manager, has of late years been entrusted with the whole of the development business connected with the undertaking; and, as will have been gathered from the foregoing remarks, this has spread at a very rapid rate throughout the whole of the area of supply. Commencing about five years ago with the slot-meter system, the Company were enabled, by waiting a little, to take advantage of the very latest improvements and methods of working this business to the greatest advantage. At the present time there are nearly 11,000 slot-meters in use; and each installation includes a gas-cooker. The Company have also done an enormous trade in the hire-purchase of cookers, heating stoves, and fittings; and, in addition, they let out on simple hire hot-water circulators, gas-steam radiators, wash-boilers, and other domestic appliances of a similarly useful character. As will be readily understood, all this has had the effect of largely stimulating the demand for gas in the city. But great as has been the success already achieved, it is hoped that—with a progressive Board and energetic management—the future of the Company will improve still further upon the long reign of prosperity that has so far been experienced.

The appointment of Engineer to the Company has been placed in the capable hands of Mr. H. D. Madden, who has for the past two or three years been Works Manager at Grangetown, where he has given the Directors of the Cardiff Gas Company every satisfaction.

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**North of England Gas Managers' Association.**—The half-yearly meeting of the Association will be held in Newcastle-on-Tyne on Saturday, the 1st prox., when Professor W. A. Bone, of Leeds, will deliver a lecture on "The Influence of Surface upon Gaseous Combustion."

## GAS STOCK AND SHARE MARKET.

**(For Stock and Share List, see p. 53.)**

AT last the patience of the Stock Exchange has been rewarded by the advent of a happier state of things, and business last week cheered up brightly. The assurance of the maintenance of peace in Eastern Europe (though some wry faces may have been made at the mode of insurance) coupled with the blessings of cheap money, at once set everything in great good humour. An excellent start was made on the opening day, though the increase in activity was not very large all at once. Prices all round had a nice rise. Consols gained $\frac{7}{16}$; and the Home Government list was strong. Railways and the Foreign Market were up; and the improvement extended sympathetically. Nothing came to mar progress on Tuesday; and the volume of business was increased, while the rise in prices proceeded merrily. The fortnightly account was light and promised to be easy. On Wednesday the cheerful tendency was still in full action; and in all the leading departments prices went from good to better. Thursday witnessed a continuation of the movement. But before the close the inevitable disposition to realize profits manifested itself, and the last prices were not the best of the day. Consols, however, were a fraction higher. Friday's movements were rather uneven and irregular—small advances and reverses alternating with not much result either way in the end. On Saturday, business was very limited, and practically there was no movement to speak of. In the Money Market, there was a strong demand for the month-end and Stock Exchange requirements. Discount rates eased away steadily. On Thursday, the Bank rate was lowered to 2½ per cent., having stood for eleven weeks at 3 per cent. Business in the Gas Market was on a reduced scale; but the general tendency all round was quite buoyant, and a large number of issues made material improvement. In Gaslight and Coke, the passing of their Bill in Parliament through the Commons' Committee was greeted with a quotation rise of 2½, marked prices advancing from par to 102¾. In the secured issues, the maximum made 88¾, the preference 104¼ and 104½, and the debenture from 84½ to 85½ (a rise of ½). South Metropolitan was strong and quiet; prices hardening from 121¼ to 123—a rise of 1. In Commercials, there was no business. Among the Suburban and Provincial group, Alliance and Dublin old realized from 18⅛ to 18¾, British 42⅝, Ilford 133½ (a rise of 3), ditto "B" 124 (a rise of 1), Lea Bridge 118½, South Suburban debenture 124½, West Ham from 116 to 119 (a rise of 4½, in view of the amalgamation terms being raised from 118 to 121 per cent. to counterbalance the reduction of 1d. in the standard price, and ditto debenture 106½ and 107. The Continental companies were very quiet. Imperial was steady at from 182 free to 183⅞, and Union at 101 and 101½. Among the undertakings of the remoter world, Buenos Ayres changed hands at 13 and 13 1/16, Monte Video at 12⅜ and 12⅝, Oriental at 140 free and 141, Primitiva at 6 5/16 and 6⅜, ditto preference at 5 1/16, ditto debenture at 96¼ and 96⅞, River Plate at 14⅛, and ditto debenture at 96¾.

## ELECTRICITY SUPPLY MEMORANDA.

### Slander Gas, if Progress Cannot be Made by Fair Means—Some Assertions at Newmarket, and a Few Questions—Boast and Result—Electricity for High-Pressure Gas Plants—Flouting the Local Government Board.

HARD put to it in effecting progress with the lighting business, the purveyors of electricity are making themselves the laughing-stock of thoughtful men by turning over the musty manuscripts of the past to find out what has been said as to the so-called poisonous and unhealthful characteristics of gas, and putting the result of research to use at shareholders' meetings and in advertising literature. A terrible list of evils arising from gas-burners was presented by Mr. F. E. Gripper, at the last meeting of the Newmarket Electric Supply Company; and we take this as an example of similar wild oratory at electrical shareholders' meetings. Mr. Gripper does not know much about the subject himself; but he takes as gospel some ancient statements by gentlemen whom he terms "eminent scientists," but who mostly paraded their views in days long since, before incandescent burners became the vogue, and who, when they published their extravagant declarations, shrunk into their shells when challenged for the proof. In the name of common sense, we ask these electrical publishers of the ancient sayings of more or less fanatical men to get their assertions proved, under modern conditions and by impartial scientists, before ignorantly holding themselves up to ridicule by an unqualified acceptance. Does it not occur to Mr. Gripper that if one-half what he says about gas lighting is true, that the Newmarket hospital ought to be full to overflowing, that the local doctors ought to be reaping a luxuriant harvest from the diseases set up and aggravated by the use of gas for lighting, and that, seeing the tremendous use of gas in excess of that of electricity for lighting, the country ought by this time to have become largely depopulated. There is little question that Mr. Gripper's forefathers were users of gas, and Mr. Gripper has doubtless himself been guilty of the same pernicious act; and if all he says is true, having lived in atmosphere "vitiated" by the "poisonous"

gases given off by gas-burners, he ought to be no longer among us. But what are the facts? Judging of the complaints of medical practitioners in many places, that they cannot all make a fair living, and bearing in mind that since 1882 (the date of the first General Electric Lighting Act) down to the date of the last Board of Trade returns (1906-7), the quantity of gas sold by statutory gas undertakings in this country has increased from 45,484,910,000 to 167,945,206,000 cubic feet—an advance of 122,460,296,000 cubic feet!—the daily growing use of gas appears to be having the contrary of a health-deteriorating effect; while, to give support to the electricians, the extending use ought to make the medical profession most attractive and lucrative. The facts do not support postulation.

We should like to know who is the "eminent medical scientist" who "recently" explained the many dangers of gas, as alleged by Mr. Gripper. This gentleman also quotes the late Professor Corfield, who used to make all sorts of random statements in the days of the old flat-flame burner; and the same may be said of his other "authority," Dr. George Carpenter. When Dr. Carpenter made the assertions quoted by Mr. Gripper, we put certain questions to him, and submitted to him certain matters for consideration, but he declined to be drawn into controversy. Professor Corfield was likewise challenged; but he was as quiet before as he is after death in regard to the challenge. However, Mr. Gripper is with us, and so, as he has adopted the statements of the "eminent scientists" of days gone by, we ask him to substantiate them. The modern scientific method of using gas for lighting is by the incandescent burner and a bunsen flame. We therefore ask him to describe the character of the vitiation of the atmosphere by gas-burners to which he refers; and to name the "poisons" given off by the incandescent gas-burner. He speaks of carbon monoxide. We should like him to explain how, with the free burning flame of the incandescent gas-burner, carbon monoxide is formed? He also adopts Dr. Carpenter's statement that, in burning, gas gives off "quantities of carbonic acid and sulphuretted hydrogen." There are few people who do not know the smell of sulphuretted hydrogen; and sulphuretted hydrogen is an impurity of gas that the Legislature compels gas suppliers to carefully remove, and it is removed—the operation being one of the simplest. If Mr. Gripper has come across that smell in a gas-lighted room, we should much like to know where and when.

As to the carbonic acid. Mr. Gripper accepts the old-fashioned statement that a gas-burner will poison the air to the same extent as two adults. We do not suppose he saw an article dealing with this very question in the "JOURNAL" for Feb. 9; and it will not do any harm to present him and others with a few extracts, on which they are invited to make any criticism they desire:

A cubic foot of gas on combustion yields approximately ½ cubic foot of carbonic acid. A human being, except when sleeping, gives off about ¾ cubic foot of carbonic acid per hour—that is to say, a "Bijou" inverted gas-burner, consuming 1 to 1½ cubic feet per hour, produces less carbonic acid than one human being. In a recent number of the "Archiv für Hygiene," Herr W. Weichardt gave an account of some investigations he had carried out on this point. In the air exhaled from the respiratory organs of human beings, he has found a high molecular poisonous product, of albuminous origin, of the character of a toxin. This discovery confirms, and affords an explanation of, Pettenkofer's observation that pure carbonic acid is far less injurious than the carbonic acid derived from respiration. Pettenkofer found that pure carbonic acid in the proportion of 100 parts per 10,000 parts of air was not injurious to human beings; while 10 parts of carbonic acid per 10,000, if derived from the respiration or perspiration of human beings, rendered the air unfit for a person to remain in it for any length of time. Recognizing this difference, Herr Weichardt points out that, in respect of harmfulness to the occupants, five incandescent gas-burners in a room are equivalent to one human being. These figures evidently refer to upturned incandescent burners. If modified to apply to the modern inverted burner, it may fairly be said that ten gas-burners in a room are not more harmful to the occupants than one adult person. Herr Weichardt goes on also to show that the gas-flames actually have a purifying influence, which electric lamps have not, on the atmosphere of rooms, by reason of their free combustion acting destructively upon the organic products of respiration.

If these remarks are not convincing, then Mr. Gripper may read up the authorities referred to by Mr. R. Stephenson, the Chairman of the Newmarket Gas Company, in a letter commenting on the ludicrous statements contained in Mr. Gripper's public utterances. These authorities are: Professor Frankland, Sir Henry Burdett, Dr. Whitelegge, Professor Frank Clowes, Dr. W. A. Aitken, and Professor Carlton Lambert. To this list we would add Professor Vivian B. Lewes, Dr. Samuel Rideal, and Mr. Otto Hehner. We shall look for Mr. Gripper's comments on these statements and replies to our questions with a great deal of interest. Shall we look in vain?

Where should electricity supply be more profitable than in a place where the cheapest electricity can be produced? It was the bold boast some time since of the Chairman of the Stalybridge, Hyde, Mossley, and Dukinfield Joint Electricity and Tramways Board that they were the people who could generate the cheapest. But the cold stubborn fact has to be faced that this year there has been an actual loss of £464 on the electricity department and of £10,000 on the tramways department. In the estimates for the year, nothing was shown on account of a deficit on the electricity department. But the fates seem to be against the concern. How is it? There is some incongruity between this position of affairs, the boast as to cheap production, and the untruths posted on the interior of the tramcars, that electric lighting is cheaper than gas lighting. If this latter has been true as long as the statement has been in circulation, there should have been such an influx of business that the electricity department ought to show to-day a handsome profit. There is some talk now of extending the use of arc lighting in Hyde; and certain members of the Corporation are, or have been, interviewing the Engineer of the Joint Board on the subject. The Engineer of the Gas Company should also be interviewed if an economical improvement in the street lighting is desired, and not merely the performing of an act of charity to the Board by handing over additional business to them at the expense of the ratepayers. Hastings and other places ought to serve as lessons to the Hyde Corporation. It is recognized by the Chairman of the Finance Committee (Mr. Councillor Perrin) that the responsibilities of local authorities are increasing. That being so, it seems to us to be a senseless thing to unnecessarily add to them. Meanwhile, the electricity and the tramways undertakings are being looked upon with rueful countenance by the local ratepayers.

What appears to be a silly piece of long-sustained pettishness on the part of the Sunderland Corporation Electricity Department has lately been brought to a close. It all arose over high-pressure gas lighting. The green-eyed monster jealously suggested the putting of all possible difficulties in the way of electricity being made the handmaid of this system of lighting. We have heard of this in other places than Sunderland. In one instance, it was held that the small amount of current required to drive a little motor to operate the gas-compressor could not be taken off the lighting cables, and that some yards of cable would have to be specially laid. But generally electrical central station engineers do not make any trouble about the matter. There are a few who do; and, in our opinion, they do so in defiance of the General Electric Lighting Acts, which do not give them discretionary powers as to supply for any purpose, providing the conditions defined by the Act are observed. The trouble at Sunderland has been with Messrs. Craven and Speeding, Limited; and it refers to a small supply of electricity for starting a Diesel oil-engine, used for compressing purposes. Correspondence on the subject began in September, 1907, and continued at intervals until Jan. 6 this year. Mr. A. S. Blackman, the Engineer of the Corporation Electricity Department, originally, it appears, flatly refused to advise his Committee to give a supply for the purpose of starting this Diesel oil-engine; and Messrs. Craven and Speeding assert that afterwards the Town Clerk told their solicitor that, if they wanted the electricity, they would have to go to law to get it. We should like to know under what Act Mr. Blackman refused the supply in the first place, and why the Town Clerk declared that the only course to get the supply was by way of the law. But wiser counsels than these have prevailed; and the Electricity Department are now willing that the firm should have the supply. The firm have been very reasonable in the matter. They have a supply of electricity at the present time; and the small quantity required for the motor they suggested should be taken off their present installation, instead of putting in a special meter. Another question has issued from the high-pressure installation. The firm's assessment has been increased in respect of the Diesel engine and plant and the requisite buildings. The firm seem to be debating now whether it would not be a wise thing to put in a private electricity generating plant; and the scheme that they have before them is said to be a somewhat attractive one. The Electricity Department in this matter, it would seem, have taken imprudent action; and certainly the publicity that has been given to it has not put them in a favourable light in the eyes of the people of Sunderland.

The Local Government Board must feel somewhat humiliated at the ease with which municipal corporations flout their decisions, and reduce their inquiries to a farce. Overspending of loans and spending loans on matters for which they were not granted, are common proceedings; and now the Hastings Corporation, when loans are asked for, and after investigation the Board do not see fit to grant them, calmly tell the Board that they will, in defiance of them, do what they desire, and the rates must bear the cost. There was an inquiry the other day into an application for £5000 for the laying of new mains and house services; and on the occasion the Inspector (Mr. A. W. Brightmore, D.Sc., M.Inst.C.E.) was told point-blank that the Council had decided, through the refusal of the Board to the last application for a loan for the conversion of incandescent gas-lamps to electric ones, to go on with the work piecemeal, and charge the cost upon the rates. If recollection serves aright, this is the second time this has happened. The Corporation are continually applying for loans for electricity purposes; and the more money they borrow, the worse off they get, for the new capital has not the same earning power as the old, and the old has been productive of deficits. There has been reckless expenditure, estimates that have not come true, and a growth of deficiency since the undertaking has been under municipal management. As considerable ratepayers who have to contribute to the making up of losses, the Gas Company opposed the last application. It is a very good thing that Hastings has bodies within the borough in a position to bring these matters to public light. There seems no other way of stopping the "Rakes' Progress" than by pressure of public opinion. Yet there are some people in Hastings who still despise hard facts, who will not look at the situation fairly and squarely in the face, and who essay to defend the policy, the pursuit of which makes the financial position progressively blacker.

## NOTES FROM WESTMINSTER.

To-morrow Parliament adjourns for the Easter Recess, and will re-assemble on April 19. The proceedings in the Committee rooms last week, save before the two sections of the Local Legislation Committee, were of small amount, though, from the gas industry's standpoint, there was importance in the discussion of certain clauses in the Gaslight and Coke Company's Bill. Concerning this measure, the labour members of the West Ham Borough Council are not at all satisfied with the amalgamation scheme, regarding it from their own narrow point of view; and therefore Mr. William Thorne, M.P.—a member of the West Ham Council, and Secretary of the Gas Workers' and General Labourers' Union—last week gave notice of his intention to make the last possible effort in the House to give the Bill its death-stroke, by moving, on the Bill being presented for third reading, that it be considered "this day six months." But as the Bill contains a clause inserted (true, in shortened form from that which they desired) at the instance of the West Ham Corporation, agreed to by a Select Committee of the House, and appearing now in terms suggested by the representatives of the West Ham Corporation, the House will recognize that Mr. Thorne does not convey the views of that body, but merely of a minority section. The Swinton and Mexborough Gas-Works Transfer Bill (which stood in the group of measures referred to Mr. Mooney's Committee, but was removed owing to agreement) has been before the Unopposed Bills Committee, and has made further progress. Several Water Bills have now also passed the first Committee stage. The water section of the Oldham Corporation Bill has been under the consideration of the Local Legislation Committee. The gas section it was expected last week would not be taken till after Easter. A great deal of local interest has been aroused by this measure, reference to which will be made in these Notes on another occasion. Among others observed in the Committee room in connection with the Bill were Mr. Arthur Andrew and Mr. Tim Duxbury. It is now announced that the Ammanford Bill will be before a Committee on April 27; and the issue of the measure will be watched with peculiar interest, in view of the direct connection it has with the ill-fated Amman Valley Gas Company—one of the miscarriages for the shareholders of the 99. Cannon Street promoting coterie. It is an altogether miserable tale that can be told in connection with this matter; and it is hoped that it will be unfolded in detail before the Committee. The Alliance and Dublin, the Aldershot, and the Yorktown Gas Companies' Bills will be coming before Committees soon after the recess. There is, even at the time of writing, practically a suspension of work until after Easter, and then more Committees of the House of Lords will set to work. Yesterday the Oldham Corporation Bill and the Llanelly Water Bill were under further consideration.

**Gaslight Bill.** It will be a surprise, after the proceedings before Mr. Mooney's Committee last Thursday, and the preceding week, if the Bill of the Gaslight and Coke Company does not go through its remaining stages without further molestation. The agreements with the two most formidable opponents weakened the body of hostility generally; the chief of the remaining opponents—the West Ham Corporation—indicated their future attitude by appearing on clauses on Thursday; and several others who raised points have been satisfied. Therefore, if Mr. William Thorne does not succeed with his motion in the House of Commons, we cannot see any quarter from which contention should arise in the House of Lords. The question of the standard for calorific power, in the form embodied in the Bill, is dealt with in our editorial columns; and so may be dismissed from attention here. The only other clause that was discussed at any length before the Committee was the one accepted by the Company, and subsequently ordered by the Committee to be inserted to the extent of acceptance in the Bill, and which provides for the West Ham Gas-Works being substantially continued for a period of ten years from the date of transfer. To give some sort of definition to the word "substantially," the Company suggested that the works should be operated to a degree substantially that preceding the date of transfer; but the representatives of the West Ham Corporation apparently saw in this an opportunity for some collusive action between the Gaslight and Coke and the West Ham Companies, whereby the works would not be operated to their full during the months preceding the transfer. The idea is a humorous one; and the plan by which they circumvent any such action is a case of mistaken cleverness. They wanted the clause altered, and of course the Company allowed them to have their way (so that they cannot now complain), in a manner to ensure the determining year of the scope of working operation being the one "prior to the introduction of the Bill for this Act." The West Ham Company are obtaining good increases of business; and the Corporation have deliberately closed the door upon themselves in respect of the increase of consumption that has taken place during the past winter and since the introduction of the Bill, and of the increase which prospects suggest will be obtained, at the seasonal rates of recent years, during the remaining months preceding transfer. The Ilford Gas Company have also had gratified their desire for a definite outlining of the area of the West Ham Company; and the authorities south of the Thames have had expressed in black and white the assurance of the Gaslight and Coke Company that there shall be a reversion to the conditions of charge existing in their area south of the Thames before the South Metropolitan Gas Company dropped their illuminating power to 14 candles. The price in the Gaslight and Coke Company's southern area is controlled by that of the South Metropolitan Company; but a difference of 2d. per 1000 cubic feet was made in favour of the Gaslight Company on the South Metropolitan Company receding to a 14-candle standard, and the Gaslight Company continuing to supply gas on a 16-candle standard. Now the Gaslight Company are coming down to the 14-candle standard. There was one other important matter to be adjusted, and this affected the West Ham proprietary; being raised by the relinquishing of 1d. by the Gaslight Company from the standard price—making it 3s. 2d. Of course, this altered the terms of transfer so far as the West Ham stockholders were concerned. But the matter has been satisfactorily adjusted, by the addition (to the £118 per cent.) of £3 of Gaslight stock per cent. of West Ham stock. The amount of stock required for this fresh purpose is to be obtained by the Gaslight Company purchasing in the open market out of their reserve fund. These are all the points of any general importance. Satisfaction has been given all round by mutual arrangement or, where the matter has been left to their judgment, by the decision of the Committee. All's well that ends well.

**The "Doubtful Character" of Gas-Works.** We live and learn. Mr. Emmott (Chairman of Ways and Means of the House of Commons) and his colleagues of the Unopposed Bills Committee last Thursday were in a pessimistic mood, or perhaps their judgment had been upset by an electrician telling them of the wonderful hopes and prospects of the electrical industry in the matter of the herculean task of removing the gas industry from the face of the earth. Simultaneously with the utterance of the statement to which we are about to refer, in a neighbouring room, the first standard calorific clause in a town gas Bill was being discussed, which, in itself, speaks of a transition period in the history of the gas industry, and of expanded potentialities and spheres of usefulness. But perhaps Mr. Emmott and his colleagues have not studied the whole of the signs of the times in relation to the gas industry. Anyway, he made a very remarkable statement in the shape of a reason for a fresh inclination of mind on the part of the Committee. The Swinton and Mexborough Bill, which embodies a scheme for a Gas Board and the purchase by arbitration of the works of the Swinton and Mexborough Gas Company, was before the Committee. Originally, the promoters proposed a period of 40 years for the repayment of the purchase money; but they had, on a report by the Local Government Board, reduced the period to 35 years. The Committee allowed this period; but the decision was accompanied by this statement "for the assistance of anybody whom it may concern." "I ought to say," observed the Chairman, "the mind of the Committee is set against any increase, and, in fact, is rather set on a decrease, in the number of years they are likely to allow for the purchase of gas-works, *because of the somewhat doubtful character of the undertaking in the future.*" Of course, no one can tell what the future has in store for any enterprise; but the gas industry itself is very well satisfied with its outlook at the present time, and can see nothing more doubtful about it now than in past years. Of more immediate importance than the reason adduced for the future policy of the Committee is that policy itself. Local authorities contemplating possession of gas undertakings may make a note of the fact that, in considering the financial bearings of purchase, a reduced repayment period for the purchase loan is a contingency not to be neglected. It may usefully disturb the views of would-be municipalizers. If it does, the thanks of gas companies will be due to Mr. Emmott, no matter how much they may dissent from his opinion.

**Water Bills before Committees.** There have been several Bills before Committees of both the House of Lords and the House of Commons. All that have reached the stage of decision at the time of writing have passed, with more or less amendment. Among them were the Clevedon and South Lincolnshire Water Bills proposing new works; and these have gone forward. The Worksop Water Bill has raised some interesting points. Its principal objects were new works and additional capital. The Bill represents one of a group brought about by the decision (in the early part of last year) in the Frimley case of the Court of Appeal, holding that it is illegal for a water company to sink wells upon land, although within their statutory area, unless power is specifically obtained for it in an Act. The Company wanted power to obtain a new supply from described wells; but it was suggested, in the course of the proceedings, that a supply could be obtained from the Manton Colliery of the Wigan Coal and Iron Company. This seemed to appeal to Lord Kintore and to his fellow Committeemen, so much so that his Lordship adjourned the proceedings for the purpose of consulting Lord Onslow, the Lord Chairman, as to whether it was competent to substitute for the construction of a well the proposal to grant a supply of water to the Company from the Manton Colliery, and further giving power to the District Council to come to Parliament next year for authority to purchase the undertaking without the enhancement of its value. The Lord Chairman thought the course could be adopted. The purchase clause was thereupon inserted; but the Company were allowed power to spend money necessary for maintaining the undertaking, and carrying out their existing obligations and "works to be done in pursuance of this Act."

Yet another echo of a decision from the Law Courts was heard in connection with the West Gloucestershire Water Company's Bill, against which the Bristol Water Company were the principal opponents. The Bill is an important one, involving an additional capital of £90,000 and £30,000 borrowing powers. But the bone of contention had reference to the supply of water in bulk to persons and authorities outside the present area of supply. The Company in their operations have not in this respect strictly adhered to the terms of the Water-Works Clauses Act; and an infringement of the Bristol Water Company's rights brought the two Companies into the Law Courts—the Bristol Company gaining the day. The West Gloucestershire Company sought by the Bill to legalize their position; and, in a large measure, they have done so, but the Bristol Company have been protected. A disputed district—Charlton—has been excluded from the Bill; and the model clause as to supply in bulk has been allowed in place of one suggested by the promoters. Extension of limits has also been the principal point of discussion in connection with the Llanelly Water Bill, which has been before Mr. Rose's Committee. The interesting feature of the scheme, however, is that referring to the filtration of the water. In this respect improvement is very much needed. Some 12 acres of land are to be taken for the purpose of ensuring purity, by the construction of filter-beds, and obtaining protection against the possibility of pollution. Five filter-beds are to be constructed as a start. The upper and lower storage reservoirs are to be separated—one being used for trade and the other for domestic supply. It is not proposed to filter the trade supply, this representing a large proportion of the whole. A great saving in capital and annual expenditure will result from this plan, though a system of duplicate mains will be required. The Northallerton Water Bill has been before the same Committee; and it was only opposed for the purpose of obtaining protection, and not from any objection to the designs of the Bill itself. The preamble was declared proved; but a clause was inserted providing for the better cleansing of the reservoirs than heretofore. There has not been much heard of the instruction, at the instance of Mr. Courthope, to Commons Committees, to consider whether the promoters have made adequate provision by their Bills for the supply of water at reasonable rates to agricultural communities within their areas of supply.

## THE HIGH-PRESSURE INVERTED GAS-LAMPS IN FLEET STREET.

The attention that the use of high-pressure inverted gas-lamps for illuminating Fleet Street has attracted in the lighting world is a sufficient reason for presenting our readers with two photographs taken in the dead of night, and by the light only of the lamps themselves. The lamps are of Keith's new high-pressure type, worked at a pressure of 54 inches, and giving an efficiency of 60 candles or upwards per cubic foot of gas consumed. The lamps being of 1500-candle power, the consumption of gas is therefore about 25 cubic feet per hour. The lamps are disposed on brackets affixed to premises bounding the roadway, on three refuge columns—Chancery Lane, Fetter Lane, and Ludgate Circus—and on one footpath standard by Bell Yard.

From the efficiency demonstrating point of view, the lamps suffer a disadvantage, in that the newspaper offices and shops of Fleet Street make such a lavish display of other external lights. It is only when night has far advanced, that these lights are extinguished and the public gas-lamps are left in sole possession; and it is merely for a short space of time before the vans arrive in the early hours to begin the work of distributing the morning papers, that the street can be found fairly well deserted for photographic work. At two o'clock one morning, a time of quiet was snatched for these two photographs, when a comparatively long exposure could be given.

The first photograph shows a portion of the street looking in a westward direction from Bolt Court; and the second from the refuge by Fetter Lane looking eastward. Of course, photographic reproduction, and reproduction again from the photograph (by the aid of process blocks and the printing-machine), cause a considerable depreciation from the real lighting effects. Upon these as actually presented in the street both the Gaslight and Coke Company and the James Keith and Blackman Company, Limited, have received much commendation; but what we should like to see is a City street, devoid or practically devoid of shops, illuminated by lamps of this new type, so that, unaided and without obstruction from other lights, a proper manifestation might be made to the City Corporation and the public of the light-giving efficiency of the lamps. The City Fathers and the public cannot be expected to sit up until about two o'clock in the morning to judge of their sole effect in Fleet Street.

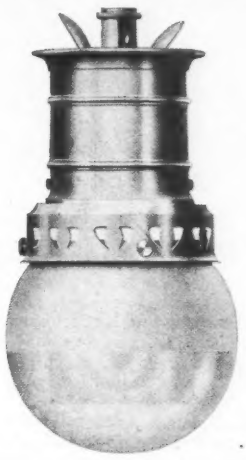
**Fleet Street Under the Light of the New High-Pressure Inverted Gas-Lamps—Looking Westward.**

## GAS STANDS AT A TRADES EXHIBITION.

An annual event at Birmingham—in which business, amusement, and philanthropy are combined—is the National Trades Exhibition at the Bingley Hall, which has already, by the handing over of a portion of the entrance fees, benefited the local Queen's Hospital to the extent of over £2000. It remains open for ten weeks, and is as attractive as good organization, enthusiastic exhibitors, and excellent music can make it. This year's show was opened about a week ago; and it is gratifying to be able to state that among the many branches that are represented the gas industry takes quite a prominent place. Electricity, of course, is also to be seen; and the lighting of the hall, which is a very large one, is divided between the two illuminants. It is, however, perfectly safe to assert that the extremely efficient general installation of high-pressure incandescent gas lighting on the Sale-Onslow system of Messrs. Thomas Glover and Co. does not suffer by comparison with the arc lights, nor do the individual gas-lighted stands when contrasted with those on which electricity is used.

Both gas and electrical appliances are exhibited by the Birmingham Corporation; but the latter we may leave to those who are specially interested in them. We must, however, congratulate the Gas Department on the first-rate display they make on their stands. Gas-fittings of the most tasteful patterns are there in plenty, as well as gas-cookers and fires and a slow combustion coke-stove. The Corporation supply and fix their own pattern gas-cookers free with penny-in-the-slot installations. In addition to this, they let out certain sizes at a quarterly rental; while larger patterns are supplied on the hire-purchase system. Returning to the gas-lights shown by the department, these are on both high and low pressure. The Sugg high-pressure lamps (for outside shop lighting, &c.) are supplied at 20 inches; the gas being taken from the general high-pressure installation at 60 inches pressure, and then lowered by means of an ordinary Sugg reducing governor. There is also on view a Sugg hot-air engine for use with high-pressure installations. The convenience of the automatic switching on and off of gas-lights is amply demonstrated by the employment of a number of pneumatic switches. A centre three-light cluster is so arranged that one of the lights can be turned up from a certain point (which in a room would be near the door), and the other two by pulling a cord attached to the gasalier. There are also three furnished rooms—bedroom, dining-room, and drawing-room—in which the uses of gas are fully demonstrated.

A special feature is made at the Gas Department's stands of the "Forward" inverted burner, the sole manufacturers of which are Messrs. Ingram and Kemp, Limited. One of the features of this burner (which was described and illustrated in the "Journal" for Sept. 15 last, p. 719) is the utilization of a closing disc on the top of the mantle, by means of which it is stated that all the heat generated by the flame within the mantle is forced to pass out through the fabric of the mantle, instead of creeping up the central tube. The result is that the burners do not light-back; and the gas can be lowered until only the tip of the mantle is incandescent. This perfect control in regard to turning the light down



**Self-Intensive Lamp with "Forward" Burner.**

has rendered the burner popular for use in churches, &c. There is no air or gas adjustment; and it is claimed that the bijou size burner gives a light equal to 20 candles with a consumption of 1¼ cubic feet of gas per hour. The bijou size is largely used in machine shops, with an anti-vibrator, for the lighting of automatic lathes, &c. There is a larger size consuming 3 cubic feet per hour and giving proportionate results; and it may be pointed out that the burners are entirely made in England. The same type of burner has also been made into a self-intensive lamp, which is said to be giving excellent results; the candle power

**Fleet Street Under the Light of the New High-Pressure Inverted Gas-Lamps—Looking Eastward.**

being about 100, for a consumption of just under 3 cubic feet of gas per hour. The tops are of aluminium, and so always keep their colour.

Another exhibit of the Gas Department is a large glass case, which contains a complete collection of the chemical and dye products obtained from the distillation of gas tar, as well as some gas-testing apparatus, and selections of Messrs. Fletcher, Russell, and Co.'s furnaces for special uses, both for amateurs and professionals. One of these will melt 56 lbs. of brass in twenty minutes; while another is intended for melting scrap gold and running it into ingots. There are also annealing plates, and appliances for brazing brass and copper tube. Enamelling muffles, both large and small, are to be seen; and it is rumoured that with the aid of the latter several "amateurs" in Birmingham are enabled to add substantially to their incomes.

At the stand of Messrs. Thomas Glover and Co. and Messrs. R. & A. Main, there is to be seen the duplicate installation of Sale-Onslow high-pressure plant which, as already remarked, supplies the whole of the high-pressure lighting to the exhibition. The total lighting power that is furnished to the hall at 60 inches pressure by this installation is about 90,000 candles. A high-pressure tinmen's bolt heater is also shown in action; the feature of this being that the bolt always goes straight into the very centre of the heat. Then there is a high-pressure gas laundry iron, the manipulation of which is watched with interest by the visitors to the exhibition. In referring to this stand, mention must not be omitted of the attractive incandescent gas street-lamp made in accordance with the patent of Mr. T. Glover which was noticed in the "JOURNAL" for Jan. 26 last (p. 250). This lamp has a copper top, and is entirely seamed and riveted. On the front of the stall are to be seen a good selection of Messrs. Main's fires and cookers, &c. The use of gas for cooking and heating purposes is also well demonstrated on other stands—by the Parkinson Stove Company, who include numerous samples of the Maughan patent geysers; and by the Cannon Iron Foundries, who, in addition to cookers and fires, exhibit various other appliances of utility to the householder.

The mantle making industry is represented by the Plaissetty Manufacturing Company and Messrs. George Bray and Co. The former now pack their soft inverted mantles in boxes of three, with one ring, so as to economize in the use of rings, and consequently in cost; the mantles being easily attached to the ring by means of a registered arrangement somewhat in the form of a slip-knot. They have also on their stall a sample of the "Litz" oxy-petrol gas machine. Messrs. Bray and Co., in addition to mantles, show their various upright and inverted incandescent burners, and other well-known specialities. "Ironclad" mantles are to be seen at the stall of Messrs. Horrell and Bowman, of Birmingham. Mr. John Thacker, the Chairman of the Birmingham Master Gas-Fitters' Association, and Mr. Felix C. Bateman, also of Birmingham, show some general gas-fittings and appliances; and Messrs. Joseph Breeden and Sons, of the same city, exhibit the "Hands" English-made self-intensive shop lamp, with which very good results are said to be obtained.

The National Gas-Engine Company have an excellent display of their types of engines, which are, of course, suitable for use with either town gas or suction gas. Messrs. Tangyes Limited and Messrs. Davey, Paxman, and Co., are also well represented in the same line. All these firms show their engines in connection with producer plants; but in Birmingham the Corporation have met the competition of suction gas by reducing the price of their gas where used for power purposes to 1s. 6d. per 1000 cubic feet. The application of a gas-engine to a private house electric light installation is illustrated by the Walsall Electrical Company.

## CLOSE OF THE "ROBERT HUNTER" FUND.

MANY of our readers will doubtless remember that rather more than ten years ago the Chester United Gas Company were suddenly deprived of the services of their Engineer, Mr. Robert Hunter, who succumbed to a paralytic seizure while sitting in his office. It will probably also be recalled that he left a widow and eight children, only one of whom was able to earn anything. With the view of assisting Mrs. Hunter in the distressing circumstances in which her bereavement had placed her, a number of her late husband's professional friends in the Manchester District Institution of Gas Engineers, of which he was one of the earliest members, and had filled the positions of Hon. Secretary and President, as well as his Masonic brethren (he was a member of the Evening Star Lodge up to within two years of his death), took steps to raise a fund to be devoted to the maintenance and education of the children. The co-operation of the "JOURNAL" was readily accorded, and in response to an appeal made in our columns a sum of £303 10s. was subscribed in about two months, in addition to which £131 18s. 11d. was raised by members of the Manchester Institution—making a total of £435 8s. 11d. After consultation with Mrs. Hunter, it was determined to place the entire amount under the control of Trustees; and three were accordingly appointed—one being Mr. W. S. Haddock, of Warrington, who was President of the Manchester Institution at the time the fund was started, and the others Mr. Donald D. Macpherson and Mr. Walter King—with absolute power to administer the fund at their discretion. When recording, in the "JOURNAL" for Sept. 12, 1899, the decision which had been come to, we took the opportunity of conveying to all the subscribers to the fund Mrs. Hunter's "very sincere and heartfelt thanks for the great kindness extended to her and her children." She said she had "no desire to touch the principal," but felt great comfort in the assurance that all her children would be properly educated and helped forward in life, and that there was a very considerable sum for them to fall back upon should ill-health prevent her doing her share towards the bringing up of her family. Besides the sum named, Mr. W. W. Woodward of Bromley, who joined the gas profession under Mr. Hunter's management, undertook to bear half the cost of the education of one of the sons.

The amount standing to the credit of the fund at the end of 1899 was £439 9s. 5d.; and it was augmented by interest and additions, so that the Trustees have been able to hand over to Mrs. Hunter from time to time sums amounting in all to about £673—the payment of the final balance having been made on the 22nd of February. In her letter acknowledging it, Mrs. Hunter says: "The money has indeed been a great boon to me, as it has enabled me to educate, clothe, and maintain my children in a way that otherwise would have been quite impossible." With the exception of the two youngest children, who are still at school, and one boy, they have all succeeded in obtaining fairly good posts. Mrs. Hunter concludes by again expressing her deep gratitude to the many friends who so generously subscribed to the fund, which, she says, "has been so valuable to us during the struggles of the past ten years." She also tenders her sincere thanks to the Trustees of the fund, for kindly undertaking the large amount of work which its management entailed.

## ANALYSIS OF SPENT OXIDE.

By A GAS-WORKS CHEMIST.

IN view of the difficulty of determining the sulphur in spent oxide, apart from tarry matters, some experiments begun some time ago, but only recently completed, are here recorded. They relate to a method in which the spent oxide is burned; the products of combustion being passed through an oxidizing mixture, and the sulphur estimated as barium sulphate. As spent oxide is mostly bought with the ultimate view of extracting its sulphur by burning, the method has the advantage of similarity between actual and laboratory practice.

A weighed quantity of spent oxide contained in a porcelain boat was placed at one end of a combustion tube; the other end of the latter being connected to a series of absorption vessels containing bromine water. On gently heating, the sulphur in the oxide burns; the products being absorbed by the bromine.

The first trials were unsatisfactory, owing to sulphur depositing in the cooler part of the combustion tube. This was overcome by maintaining the tube at a red heat throughout its length—this being more satisfactory than placing the oxide at the end nearer the absorption vessels. Even with this modification, the sulphur recovered was still too low; and it was found that some was passing through the bromine without being taken up. The few cubic centimetres of pure bromine were only placed in the first vessel—the others at the start contained water only; and although the bromine vapour is carried throughout the series of bottles, it was seen that this was not as effective as it should have been.

After many trials, the method as finally employed consists in heating 10 grains of the spent oxide in a porcelain boat in a combustion tube heated to a dull red throughout its length; the boat being placed two-thirds of the way down the tube, so that the incoming air is heated prior to reaching the oxide. The products of combustion are drawn by means of a pump through four absorption bottles, each containing 5 c.c. of pure bromine (free from sulphur) and sufficient distilled water to give a seal of about 4 inches. At the end of the combustion (the pump being kept working to clear the tube), the solutions are united (the last bottle, if tested separately, should be free from sulphur), the excess of bromine boiled off, barium chloride added, and the precipitated barium sulphate washed, ignited, and weighed as usual.

By this method, a test on 5 grains of pure flowers of sulphur gave 36·3 grains of barium sulphate, which equals 4·985 grains of sulphur—equivalent to 99·7 per cent. of the original quantity taken.

In connecting the absorption vessels, care must be exercised that the joints are glass to glass, so as to avoid any contact between the gases and the india-rubber tubing.

If the oxide contains any quantity of ammonium sulphate, this must be allowed for, as the heat volatilizes it, and it is consequently carried to the bromine solution. [One per cent. of ammonium sulphate contains 0·24 per cent. of sulphur.] Any sulphur in the tarry matters contained in the oxide may be neglected.

It is essential that the oxide be only gently heated, so that the combustion is gradual; and the gases must be aspirated slowly. The combustion takes about an hour.

# THE CONDITIONS FAVOURABLE TO THE PRODUCTION OF METHANE.

By Thomas Holgate, M.Inst.C.E., F.C.S.

The great importance of methane in coal gas is allied to that of the unsaturated hydrocarbons; so that a thorough understanding of the former is likely to shed light on the formation and preservation of the latter. The interest is not diminished, but rather heightened, by the figures so far available as to the quantity and composition of the gas made in vertical retorts, whether operated intermittently or continuously. The diversity of the figures pertaining to these retorts and to horizontals (as shown in Table XXV., which appeared in Vol. CIV. of the "Journal," p. 118), forms a sufficient justification for further inquiry as to the determining conditions with respect to methane.

The paper of Mr. I. Bond, of Southport, read before the Institution of Gas Engineers in 1905, furnishes some data of a valuable character for tracing the effect of temperature upon distillation in horizontal retorts; and for some additional information thereto, the present writer has to thank that gentleman. Mr. Bond mentioned an experiment upon a charge 12 inches thick; but his valuable details refer to two nearly parallel experiments, each with a charge 6 inches thick—the initial temperature thereof at the floor of the retort being 480° C. and 680° C. respectively. In the first of these two, there were obtained after removal of the carbonic acid, 9955 cubic feet per ton of 14·25-candle gas tested in an argand burner with a 3-inch flame. In the second, similarly, 11,486 cubic feet per ton of 13·47-candle gas were obtained. The candles per ton work out at 28,372 and 30,943 respectively—a gain of 2571 = 0·9 per cent. by the increased temperature of the retorts. The 12-inch charge was worked off in eight hours, the 6-inch charges in 360 and 320 minutes respectively; the corresponding figures for the first-named being 11,195 cubic feet × 13·3 candles = 29,779 candles per ton. The incidence of heat in this case was different to that in the other two; and, further, as the details for each interval of time are not given for this case, our lessons must, of necessity, be drawn from the others almost exclusively.

The above-named results represent the yield in illuminating value per ton deduced from the paper; but by taking the average illuminating and calorific values with the production in cubic feet for each interval of twenty minutes, the results are as follows: 480° C. test, 9954 cubic feet × 15·18 = 30,228 candles per ton; 680° C. test, 11,486 × 13·77 = 31,644 candles per ton—a gain of 1416 = 4·7 per cent. The gross and net calorific values per ton equal 6376 and 5751; 6825 and 6107 thousands respectively—a gain of 449 = 7 per cent. gross and 356 = 6·2 per cent. net. The two sets of figures of this and the preceding paragraph are not seriously divergent, and appear to be the inevitable difference due to experimental conditions; and the latter set is only given because it is necessary for the object of this article to deal in detail with each twenty minutes' interval.

When these are summarized, the figures just given ought to accord therewith. Table I., which gives the details, shows that, broadly, the higher temperature distillation gained up to 140 minutes from starting, after which the low temperature gained. This comparison applies to the quantity of gas and to the illuminating and calorific values. In these tests—but not in the 12-inch thick charge—the highest temperature was that of the coal in contact with the floor of the retort, and the lowest usually that of the middle of the coal mass. That these varied considerably is evident from the maximum and average given in the table. The conduction of heat through the coal would probably be lowest in the 480° C. test; and the figures for the quantity of gas produced therein, raise the question whether the gushes were coincident with the accession of the necessary distillation temperature to succeeding layers of coal. In both tests, the best returns are from the gas made during the first 140 minutes. But to gain an insight into the components thereof, an examination must be made of the respective illuminating and calorific figures.

Table I.

| Twenty Minutes Intervals from the Start of Distillation. | Temperature Centigrade. | | Gas in Retort Estimated Minutes. | Cubic Feet Produced During Twenty Minutes. | Gas Produced in Twenty Minutes. | | Temperature Centigrade. | | Gas in Retort Estimated. Minutes. | Gas Produced During Twenty Minutes. | | | From Beginning of Distillation. Minutes. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | At Bottom of Charge. | Average of Charge. | | | Candle Feet Value of Gas. | Gross Calorific Value B.Th.U. | At Bottom of Charge. | Average of Charge. | | Cubic Feet. | Candle Feet Value. | Gross Calorific Value of Gas. B.Th.U. | |
| | 480° | | | | | | 680° | | | | | | |
| 1 | 530° | 348° | 2·7 | 151·8 | 459 | 97·4 | 700 | 563 | 1·3 | 314·9 | 1195·4 | 246·6 | 20 |
| 2 | 565° | 378° | 3·3 | 121·6 | 519 | 101·5 | 720 | 623 | 1·6 | 254·8 | 903 6 | 174·0 | 40 |
| 3 | 600° | 408° | 3·0 | 133·1 | 570 | 111·8 | 740 | 680 | 2·0 | 204·8 | 714·0 | 136·4 | 60 |
| 4 | 633 | 444 | 3·0 | 133·8 | 566 | 105·4 | 760 | 726 | 2·3 | 174·5 | 563·7 | 108·0 | 80 |
| 5 | 667 | 482 | 2·6 | 152·7 | 562 | 110·2 | 780 | 751 | 2·0 | 194·8 | 606·2 | 117·5 | 100 |
| 6 | 700 | 520 | 3·0 | 133·4 | 467 | 90·7 | 800 | 777 | 2·2 | 184·3 | 534·5 | 110·8 | 120 |
| 7 | 720 | 540 | 2·4 | 163·5 | 565 | 111·0 | 830 | 810 | 1·9 | 205·5 | 568·4 | 122·3 | 140 |
| | | | | 989·9 | 3707 | 728· | | | | 1533·6 | 5085·8 | 1015·6 | |
| 8 | 740 | 610 | 3·0 | 133·2 | 444 | 88·2 | 900 | 867 | 2·4 | 164·3 | 421·9 | 95·1 | 160 |
| 9 | 760 | 640 | 2·3 | 172·7 | 521 | 110·2 | 930 | 900 | 2·3 | 175·5 | 427·5 | 59·5 | 180 |
| 10 | 778 | 693 | 2·6 | 154·7 | 444 | 97·3 | 956 | 916 | 2·0 | 195·6 | 453·0 | 108·0 | 200 |
| 11 | 800 | 740 | 2·3 | 174·0 | 482 | 106·3 | 984 | 932 | 2·6 | 154·7 | 333·8 | 82·3 | 220 |
| 12 | 815 | 760 | 2·8 | 143·5 | 390 | 86·2 | 1010 | 948 | 2·3 | 174·2 | 369·3 | 88·5 | 240 |
| 13 | 821 | 775 | 2·4 | 163·5 | 417 | 94·8 | 1020 | 964 | 2·6 | 154·4 | 307·9 | 76·0 | 260 |
| 14 | 828 | 808 | 2·8 | 144·5 | 353 | 81·2 | 1030 | 980 | 3·0 | 133·9 | 243·4 | 61·0 | 280 |
| 15 | 835 | 820 | 3·0 | 134·0 | 313 | 72·3 | 1020 | 1000 | 3·9 | 103·1 | 161·9 | 45·8 | 300 |
| 16 | 850 | 840 | 3·2 | 124·3 | 227 | 60·6 | 1015 | 1000 | 4·9 | 82·2 | 106·9 | 34·5 | 320 |
| 17 | 900 | 860 | 4·9 | 82·0 | 143 | 36 8 | — | — | — | — | — | — | 340 |
| 18 | 940 | 880 | 5·6 | 72·2 | 114 | 31·7 | — | — | — | — | — | — | 360 |
| Produce after the 140th minute . . . . | | | | 1498·6 | 3,850 | 866 | — | — | — | 1337·9 | 2825·6 | 690·6 | |
| Produce of the whole distillation . . . . | | | | 2488·5 | 7,557 | 1594 | — | — | — | 2871·5 | 7911 | 1706·2 | — |

It is manifest from Table I. that the rate of gas production varies much more in the second, or high temperature test, than in the first. The ratio between the production during the first and sixteenth interval is, in the second case, $\frac{314·9}{82·2} = 3·8$, and in the first $\frac{151·8}{124·3} = 1·2$. This must have an important influence on the products of the distillation, causing the gas, for instance, in the last period of the second test to have a long time of contact with a retort and its contents at an undesirably high temperature, judged from the standpoint of methane preservation. To find out the average time of contact of the gas, it is first necessary to know the cubical capacity of the retort, which was of 20 in. by 15 in. internal cross section. The layer of coal, which was 6 inches thick, would leave a space barely one square foot, which, for a retort 20 feet long, would mean about 20 cubic feet. In the first test, the average production of gas was 6·91 cubic feet per minute, and in the second 8·97 cubic feet. The average time of contact of the gas would be $\frac{20}{6·9} = 2·9$ minutes, and $\frac{20}{8·97} = 2·23$ minutes. But this will be seen to vary in the intervals shown in Table I., from 2·7 to 5·6 minutes and from 1·3 to 4·9 minutes—a range notably different in the two instances, and, moreover, liable to a greater variation than these figures show. While the average time of contact is shown for each period of 20 minutes, yet the gas generated nearest the ascension pipe would presumably escape contact in a shorter period, and that farthest away in a longer period than the figure which represents the average. Possibly gas in some part of the charge, or at some period in the distillation, may be some ten, fifteen, or more minutes in contact with heated surfaces.

It would appear that we are justified in attaching importance to this fact when we see, by Table I, how the gas falls off in quantity and quality in the second test compared with the first, at the time when the rate of gas generation has diminished and the temperature has risen, with the result that the hydrocarbon content is impoverished. It is doubtless risky to make minute comparisons between the details of these two tests; but the following observations may be made with such reservation being duly borne in mind. An instance of the effect of temperature alone, without alteration in time of contact, appears in line 11 for the first test contrasted with line 12 of the second test, where, with the same quantity of gas, the quality is 30 per cent. higher for lighting and 20 per cent. for heating—the average temperature in the one case being 740° C., and in the other 948°. Similarly line 17 of test No. 1 compared with line 16 of test No. 2 shows, with the same output of gas, 143 candle feet against 106·9—a gain of 33 per cent. for lighting and from 34·5 to 36·8, or only 6·6 per cent. for heating.

It is clear then that, even at the end of the distillation, there are hydrocarbons present that affect the illuminating value more notably than the calorific value. The chief consideration appears to be the combined effect of increased time contact along with increased temperature; for the period after 140 minutes shows that the quality suffers more from the high temperature than does the quantity—indeed, it would seem that the quantity was maintained

at the expense of the quality. The indications of the illuminating value are more sensitive than those of the heating value; and if they are followed in the table, it will be noticed where diminution in the production of lighting hydrocarbons has begun, or possibly decomposition in one part of the retort has immediately followed upon such production in another part. Although perhaps less marked, yet the influence can be traced in the heating values; and Diagram No. I. shows this. The gross calorific value of the gas produced from the 5 cwt. of coal during each 20 minutes is shown in thousands of B.Th.U., as in columns Nos. 7 and 13 of Table I.

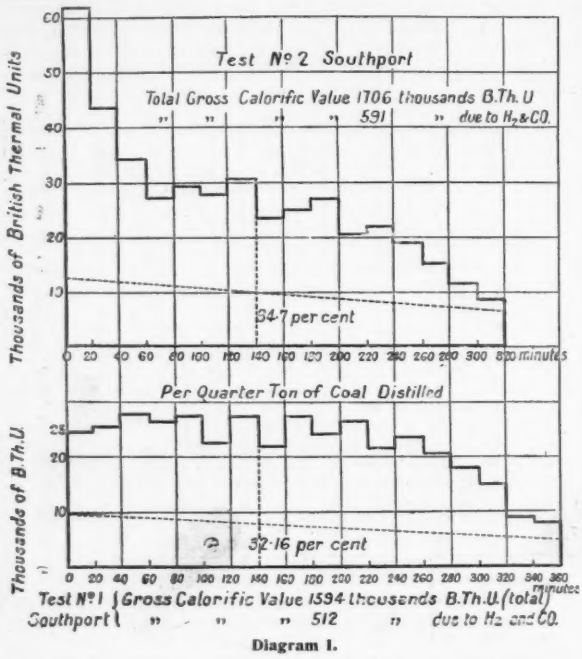

Test No 2 Southport
Total Gross Calorific Value 1706 thousands B.Th.U
" " " " 591 " due to H2 & CO.
Thousands of British Thermal Units
34·7 per cent
minutes
Per Quarter Ton of Coal Distilled
Thousands of B.Th.U
32·16 per cent
Test No 1 Gross Calorific Value 1594 thousands B.Th.U (total)
Southport " " " 512 " due to H2 and CO.

**Diagram I.**

The total amount is 1706 thousands for the second test and 1594 for the first test. Of this it is estimated that 591 thousands are probably due to hydrogen and carbon monoxide in the former and 512 thousands in the latter; leaving for hydrocarbons 1115 and 1082 respectively. The dotted line has been drawn to give an approximate idea of the energy due to hydrogen and carbon-monoxide, allowing for a lower percentage in the mixed gases at the beginning and a higher percentage at the end of the distillation. The diagram shows that the gain in test No. 2 is entirely due to the temperature at the start being better suited to the requirements of the case, and that it loses a large proportion of the advantage gained by overheating in the latter stages. The more uniform line for the low temperature shows that probably a smaller percentage of the higher hydrocarbons were then being broken up.

The percentage of heating value due to hydrogen and carbon monoxide has been calculated by assuming the two to be equal to 60 per cent. by volume in both cases; but this must favour test No. 2. The figures thus assumed show 32·16 and 34·7 per cent. for tests Nos. 1 and 2 respectively; leaving 67·84 and 65·3 per cent. for the hydrocarbons respectively. Bringing together these computations of the Southport tests, and comparing the figures with those for typical cases recently investigated, we obtain the following table:—

TABLE II.

| Place of Test. | Kind of Retort. | Total Heating Value of Gas. | Heating Value Due to Hydrocarbons. | Per Cent. of Total. |
|---|---|---|---|---|
| Nottingham . . . | Horizontal, small test | 7,734,881 | 5,178,426 | 67 |
| Dessau (non-steaming) | vertical 4-metre | 6,799,310 | 4,358,515 | 64 |
| Nine Elms . . . . | vertical | 7,411,562 | 5,137,335 calculated. | 69·3 |
| Southport, low-temperature test. . . . | horizontal | 6,376,015 | 4,325,491 | 67·84 |
| Southport, high-temperature test . . . | " | 6,824,942 | 4,458,826 | 65·6 |

The first in Table II. represents Newcastle coal tested in an experimental iron retort, in which it is probable the gas was all liberated in twenty-five minutes, and that the time of contact would not exceed two minutes. It was one of a series of tests to find out the effect of an increase of temperature; and this, the highest of the series, gave distinctly the best results. May we infer that the pre-eminence is due to suitability of temperature and shortness of contact? And may the like inference be extended to the verticals at Nine Elms? The temperature of distillation at Dessau is not given—it is generally understood to be a high one—yet the total results are intermediate between the two Southport tests, and the percentage due to hydrocarbons the lowest of the five. This relation would lead us to inquire whether the decomposition of the hydrocarbons had taken place through a proportion of the gas having to pass through a mass of coal that would act as a contact substance, facilitating the breaking-up of ethylene, and even of methane. The difference between the figures for illuminating power given by Mr. Körting in January last year for the Mariendorf results—viz., 10·7 candles—and the figures (15·87, Vol. CII., p. 798) given by Mr. Hayman in June is large. Is it an indication of an improvement effected by a more easy exit for the gas provided by charging the coal in two distinct streams with the round pieces in the centre? Again, while the theory advanced by Dr. H. G. Colman (see "JOURNAL" for March 17, 1908, p. 683) is, in the writer's opinion, inapplicable to the case there dealt with, yet is it not conceivable that such an action may occur in a minor degree in the Bournemouth retort when steam is not excluded, and may explain the low figure for the unsaturated hydrocarbons in the test at Nine Elms? For there is this important difference—the heavy hydrocarbons must have been nearly all driven off in the Dessau retort before steam was applied; whereas at Nine Elms the steam admission would be simultaneous with the generation of hydrocarbons.

Diagram II. shows the gross and net calorific values per cubic foot, and also the difference thereof, in the two Southport tests, and indicate the presence of more hydrocarbons in the low temperature test. From this, and the preceding information, the commercial problem appears to be to gain the advantage of the first half of the high temperature distillation without the disadvantages of the second half. How far these views are tenable will best be discussed after detailed consideration of the properties of methane and ethylene ascertained experimentally during recent years.

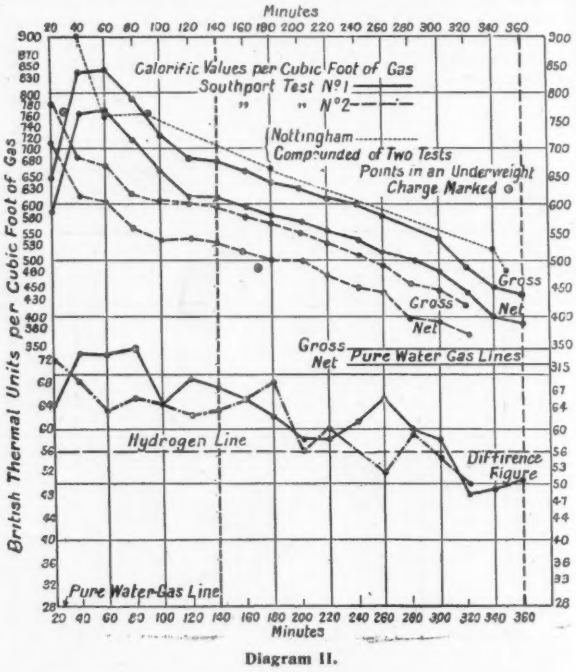



**Diagram II.**

M. Mayer and V. Altmayer, of the Technical High School at Karlsruhe, have determined the conditions of equilibrium at successive temperatures between hydrogen and methane, under atmospheric pressure. They find that the percentages of methane, as shown in Table III., are stable in the presence of hydrogen according to the reversible reaction $C + 2H_2 \rightleftarrows CH_4$. The thermodynamic expression for the equilibrium is $21{\cdot}1 + \frac{18{,}507}{T} - 5{\cdot}9934 \log_e T - 0{\cdot}002936\, T = R \log_e \frac{p_{CH_4}}{p^2_{H_2}}$, where T is the absolute temperature on the Centigrade scale, R is the gas constant expressed as 1·985 calories, and where $P_{CH_4}$ is the pressure of the methane and $p_{H_2}$ the pressure of hydrogen in the mixture. From the equation it will be seen that with decreasing hydrogen pressure the equilibrium pressure of $CH_4$ rapidly falls. Thus at $850° = 1123°$ C. absolute, where, at atmospheric pressure, 1·59 per cent. of methane is in equilibrium with hydrogen, whose pressure is that of 98·41 per cent. or 0·9841 atmospheres, a decrease of the pressure of the hydrogen to 0·1 atmosphere lowers the methane content to 0·016 per cent.

These figures, of course, mean that the percentages of methane and hydrogen given in the second and third columns would exist under atmospheric pressure at the temperatures named, provided sufficient time were allowed for equilibrium to be attained. In other words, these relations are those to which the gases are tending with a force and at a rate proportional to their distance from the point of equilibrium. Other things being equal, it is reasonable to expect these ratios to exist where the gases are reacting, as in the generation of methane from the hydrogen and carbon of coal. But we cannot predicate these figures precisely for the

TABLE III.

| Temperature Centigrade. | Percentages in Equilibrium. | | Increment Per 50° C. | Per Cent. of Original $CH_4$ Decomposed. | Increment Per 50° C. |
|---|---|---|---|---|---|
| | $CH_4$ | $H_2$ | | | |
| 250° | 98·79 | 1·21 | .. | 0·609 | .. |
| 300° | 96·90 | 3·10 | 1·89 | 1·57 | 0·96 |
| 350° | 93·12 | 6·88 | 3·78 | 3·56 | 1·99 |
| 400° | 86·16 | 13·84 | 6·96 | 7·43 | 3·87 |
| 450° | 76·80 | 23·20 | 9·36 | 13·12 | 5·69 |
| 500° | 62·53 | 37·47 | 14·27 | 23 05 | 9·93 |
| 550° | 46·69 | 53·31 | 15·84* | 36·37 | 13·32 |
| 600° | 31·68 | 68·32 | 15·01 | 51·88 | 15·51 |
| 650° | 19·03 | 80·97 | 12·65 | 68·02 | 16·14 |
| 700° | 11·07 | 88·93 | 7·96 | 80·07 | 12·05 |
| 750° | 6·08 | 93·92 | 4·99 | 88·53 | 8·46 |
| 800° | 4·41 | 95·59 | 1·67 | 91·55 | 3·02 |
| 850° | 1·59 | 98·41 | 2·82 | 96·87 | 5·32 |

interior of a gas-retort, because the reaction to which they apply $C + 2H_2 \rightleftharpoons CH_4$ is doubtless accompanied by the production of water gas $C + H_2O = CO + H_2$, and by two others $CO + 3H_2 \rightleftharpoons CH_4 + H_2O$ and $CO_2 + 4H_2 \rightleftharpoons CH_4 + 2H_2O$, and, further, because of the presence of heavy hydrocarbons and of the incombustibles, which affect the partial pressures of the hydrogen and methane. As, however, the two last-named gases frequently total 82 per cent., and sometimes 90 per cent., of the coal-gas product, the preceding data must be largely applicable, and for exact purposes can be recalculated for nine-tenths of an atmosphere or any other given condition. Notwithstanding these reservations, the figures of Mayer and Altmayer, from which the tables have been deduced, are of fundamental importance; and Diagram No. III. shows the behaviour of methane and hydrogen

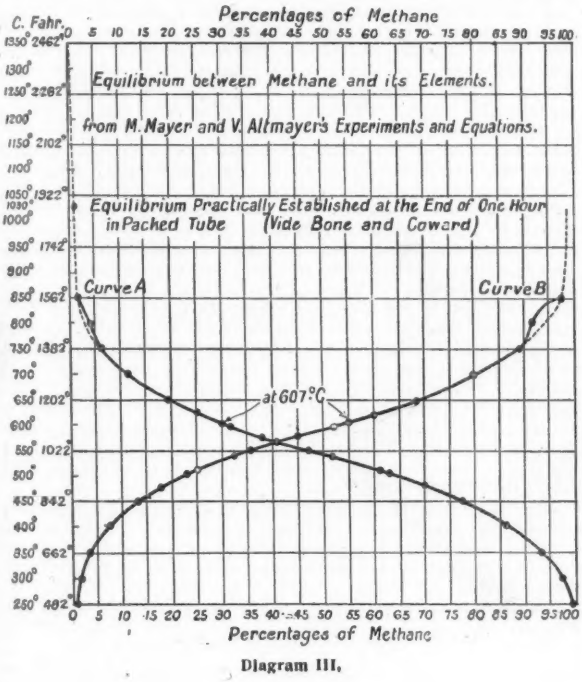

Percentages of Methane
C. Fahr.
Equilibrium between Methane and its Elements.
from M. Mayer and V. Altmayer's Experiments and Equations.
Equilibrium Practically Established at the End of One Hour in Packed Tube (Vide Bone and Coward)
Curve A
Curve B
at 607°C.
Percentages of Methane

Diagram III.

under heat from 250° C. to 1030° C. The result at the last-named temperature is due to Professor Bone and Mr. H. F. Coward. The curve . A... shows the percentage of methane in equilibrium with hydrogen in accord with the second and third columns of Table III. At 250° C., scarcely any methane will be decomposed; while at 1030° C. only 1 per cent. remains undecomposed. But the last equilibrium was only attained after heating for an hour in a tube containing quicklime as packing. About 607° C., it appears that the rate of decomposition of methane per degree rise of temperature is at its maximum; the maximum being shown both by the decrease of volume of methane per cent. (Curve A), and also by the increase in the percentage of the original methane decomposed (Curve B). These are not identical figures, and their relation is shown in the fourth and sixth columns of Table III., and in further detail for the maximum point as follows:—

TABLE IV.

| Temperature. Centigrade. | Hydrogen Present. Per Cent. | Methane Percentage. | | Percentage of the Original Methane Decomposed. | |
|---|---|---|---|---|---|
| | | Present. | Decrease Per Degree of Temperature. | Amount. | Per Degree Increase of Temperature. |
| 577° | 61·78 | 38 22 | .. | 44·70 | 0·312 |
| 600° | 68·32 | 31·68 | 0·2843 | 51·88 | 0·312 |
| 607° | 70·60 | 29·40 | 0·3250 | 54·56 | 0·383 |
| 625° | 75·25 | 24·75 | 0·2583 | 60·32 | 0·320 |
| 650° | 80·97 | 19·03 | 0·2288 | 68·02 | 0·308 |

This important fact explains how it is that injury to hydrocarbons by high temperature in the retort is not so serious as might be expected from consideration of the effect of medium temperatures. The hydrogen liberated by the decomposition of the methane acts as a brake by its accumulation of partial pressure to prevent further decomposition of methane. Thus above 607° C. the retarding action of the square of the hydrogen pressure is greater than the effect of heat in driving the reaction; and as a result there is, at 800° C., a less increase in the rate of decomposition of methane per degree of temperature than there is at 400° C.

It may be well at this juncture to inquire whether these facts are not capable of explaining some of the phenomena that accompanied attempts a few years ago to improve coal carbonization by passing through the retort a quantity of water gas. The passage of such gas would help to take away the methane from the hot surfaces, and thus reduce the chances of its decomposition by heat. But so far as the water gas introduced had a less partial pressure of hydrogen than the coal gas from the last stage of a distillation, so would it reduce the retarding influence thereof; and, consequently, what would be gained by one influence might be partially or wholly lost by the other. It is quite conceivable that if hydrogen alone had been admitted, instead of water gas, the hopes of the experimentalists might have been realized.

So far as the writer knows, there is no available information sufficiently complete to be able to determine whether the relationship of methane to hydrogen in the gas-retort follows the law of their equilibrium; but in the absence thereof, he has examined data furnished by Mr. Lewis T. Wright of certain tests carried out on coals undergoing a six-hours' distillation, giving analyses, but no quantities of gas, and no temperatures. These he has compared with the two tests at Southport, which give quantities of gas at frequent intervals, with their calorific values, but no analyses. Such a comparison cannot be pressed very closely; but there is such concordance in the general results that Table V. has been compiled summarizing the result of a large number of calculations thereupon.

TABLE V.

| Nottingham Tests. | | | | Southport Tests. | | | | |
|---|---|---|---|---|---|---|---|---|
| Particulars of the Test Conditions. | Minutes from Starting Distillation. | Gross Calorific Power Calculated from Analysis. | Approximate Equilibrium Temperature Calculated from H÷ by $CH_4$ Percentage. | Minutes from Starting Distillation. | Gross Calorific Power Observed. B.Th.U. | Temperature by Pyrometer Centigrade. Average. | Temperature by Pyrometer Centigrade. Maximum. | Particulars of the Test Conditions. |
| Test A. Six hours' duration of charge. | .. | .. | .. | 80 | 788 | 444 | 633 | Test No. 1, beginning at 480° C. 5 cwts. coal, 6 hours' charge. |
| | .. | .. | .. | 100 | 722 | 482 | 667 | |
| | 90 | 761 | 520° C. | 90 | 753 | 463 | 650 | |
| | 205 | 638 | 575° C. | 180 | 638 | 640 | 760 | |
| | 335 | 526 | 620° C. | 300 | 540 | 820 | 835 | |
| Test B. Six hours' duration of charge. | 40 | 905 | 475° C. | 40 | 835 | 378 | 565 | Test No. 1. Ditto. |
| | 180 | 665 | 560° C. | 160 | 662 | 610 | 740 | |
| | 345 | 476 | 660° C. | 326 | 476 | 846 | 867 | |
| Test C. One light-weight 4-hour charge. | .. | .. | .. | 20 | 783 | 563 | 700 | No. 2 test, beginning at 680° C. 5 cwts. coal, 5½ hours' charge. |
| | .. | .. | .. | 40 | 683 | 623 | 720 | |
| | 30 | 760 | 536° C. | 30 | 733 | 593 | 710 | |
| | 165 | 487 | 635° C. | 260 | 492 | 964 | 1020 | |

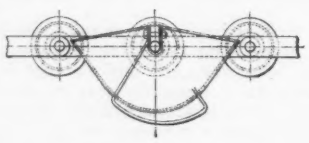
From these figures, it would appear that conformity with equilibrium is greatest at the lower temperatures. This is quite considerable in all the three comparisons; but in the higher temperatures all three show a higher content of methane than equilibrium between hydrogen and methane would lead us to expect. Of this divergence, there are at least two possible explanations. First, that while some parts of the coal are at a moderate temperature the methane produced there is not decomposed sufficiently rapidly during the time the gas is in the retort to reach the equilibrium proportions corresponding either to the maximum or average temperature.

This view necessarily relies for its soundness upon the slowness of decomposition of methane, observed by Professor W. A. Bone and Dr. F. Haber, whose experiments will be dealt with later. Secondly, the presence of hydrogen assists the decomposition of ethylene into methane; and this secondary formation of methane would go to swell the methane content, providing it were withdrawn from the retort with sufficient rapidity to delay the further decomposing effect of heat. Besides these two considerations, there is another, which, according to the balance of conditions, might add to the methane content, or, at a higher temperature, lower the methane with the production of hydrogen and carbon monoxide; the altered partial pressure of hydrogen again having a preserving effect upon the remaining methane. $CH_4 + H_2O \rightleftharpoons 3H_2 + CO$. When methane reacts with steam, it produces three times its own volume of hydrogen along with its own volume of carbon monoxide. The partial pressure of such a mixture would be 75 per cent. hydrogen; and from what we have seen before, this would lower the rate of decomposition of the remaining methane. Subsequent figures will show that there is a possibility of this reaction being of considerable magnitude in certain instances.

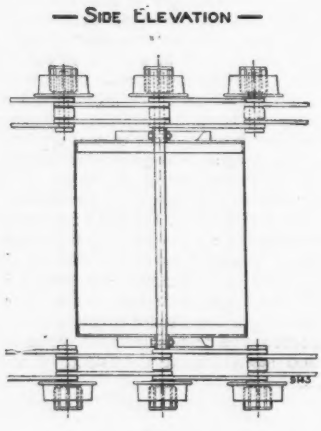
*(To be continued.)*

## A NEW GRAVITY BUCKET CONVEYOR.

A new gravity bucket conveyor has recently been patented and introduced by Messrs. Graham, Morton, and Co., of Leeds; and the accompanying illustration will give readers an idea as to its construction.



— Side Elevation —



—Plan—

— End Elevation —

The buckets are built up of mild-steel body-plates with cast-steel sides. The bucket side is so designed that it can be fitted after the chain is fixed, by means of chilled cast-iron pads, secured by bolts or pins. The chain used is of the firm's well-known standard design.

The advantages which are claimed for this bucket over those of ordinary type are that it may be fixed or disconnected without disturbing the chain; the buckets being mounted on the spindle connecting the two strands, the chain is not twisted, as in the case where a bucket is engaged with short pins projecting from each strand; and, further, the bearings are of the swivel type—thus making it impossible for the bucket to grip or tighten should the spindle for any reason get out of the square.

## MANCHESTER JUNIOR GAS ASSOCIATION.

The Tenth Annual Meeting of the Association was held on Saturday, at the Exchange Hotel, Manchester. Mr. E. J. Wellens (Hebden Bridge), the retiring President, occupied the chair at the commencement; and he was supported by Mr. J. Taylor (Mossley), the President-Elect, Mr. J. Alsop, the Hon. Secretary, and Mr. R. W. Garlick, the Hon. Treasurer.

During the first portion of the proceedings, the following visitors were present: Mr. J. Hewett, Past-President of the Midland Junior Association; Mr. S. W. Shepherd and Mr. C. T. B. Roper, of the Yorkshire Junior Association; and Mr. W. J. Liberty, of the London and Southern Junior Association. To these gentlemen, who had earlier in the day taken part in a conference of the Councils of the Junior Associations, Mr. Wellens extended a cordial welcome on behalf of the members of the Manchester Association.

Mr. Hewett, in responding, referred to the advantages to be derived from such conferences as that in which they had just taken part; and he, with Mr. Shepherd, brought greetings from their respective Associations to the Manchester Association, coupled with the best of wishes for its continued prosperity and usefulness.

### Annual Report and Accounts.

The annual report of the Council was then presented. They recorded with satisfaction a largely increased membership of the Association; there being now 157 names on the roll, compared with 116 at the beginning of the session. Two of the members, having obtained appointments out of the district, had resigned. Having referred to the fact that by a special provisional rule the session had extended from September, 1907, to March, 1909, the Council added that the year had been remarkable for the following important innovations: For the first time in the history of the Association a definite syllabus had been printed and handed to the members in advance; the first united meeting of the English Junior Gas Associations was held in Manchester at the Gas Exhibition in November, 1907, the second taking place at the Franco-British Exhibition in London; a Joint Council had been formed of delegates from the Junior Gas Association Councils to meet annually to discuss how best to further the interests of juniors throughout the country; and the session had for the first time seen the publication of the Transactions of the Association. The Council also recorded with satisfaction the introduction of a series of "coffee meetings;" the success of these being demonstrated by the interest taken in them, and the papers submitted for discussion. Thanks were tendered to the following gentlemen for lectures delivered to members and papers given at meetings during the session: Dr. Harold G. Colman, M.Sc., of London; Mr. Isaac Carr, M.Inst.C.E., of Widnes; Mr. R. S. Gibson, Assoc. M. Inst.C.E., of Liverpool; Mr. H. Davis, of Blackburn; Mr. J. Alsop, of Stockport; Mr. J. E. Dudley, of Higginshaw; Mr. F. Thorp, of Manchester; Mr. H. H. Mercer, of Widnes; and Mr. D. V. Hollingworth, of Salford. Thanks were also extended to Mr. Alsop for taking up the duties of Secretary to the Association, in succession to Mr. A. L. Holton, who, in recognition of his four years' service, was in November last presented with a handsome timepiece. Sixteen Council meetings had been held during the extended session.

The balance-sheet, certified by Mr. J. Robinson (Altrincham), showed that the year wound up with a sum on the right side. Subscriptions yielded an income of £45 15s.; and the principal item in the expenditure column was £28 12s. 6d. for printing and stationery.

No question arose on the report and accounts; and they were formally adopted.

### Election of Officers.

There were three nominations for the vice-presidency; and, on a ballot, the Scrutineers announced that Mr. F. Thorp, the Council's nominee, had been duly elected. The following other appointments were made:—

*Hon. Treasurer.*—Mr. R. W. Garlick.
*Hon. Secretary.*—Mr. J. Alsop, Stockport.
*Auditor.*—Mr. J. Robinson, Altrincham.
*Members of the Council.*—Messrs. R. B. Braddock, J. E. Dudley, C. E. Teasdale, C. Woodhead, and W. Buckley.

All were re-elections with the exception of the last-named, who takes the place of Mr. Thorp for the unexpired term.

Mr. Thorp, in acknowledging his election as Vice-President, said he considered a great honour had been done him, because in due course he would succeed to the highest position the Association could offer to a member. He looked upon the Association as having done a very large amount of good.

On the motion of Mr. W. Buckley (Manchester), seconded by Mr. S. Carter (Garston), a hearty vote of thanks was accorded to the officers.

Mr. Braddock having replied for his colleagues and himself,

### Introduction of the New President.

Mr. Wellens, in asking his successor to take the chair, expressed the hope that Mr. Taylor would have a very pleasant year of office, and that the membership of the Association might be increased during his presidency.

### Thanks to the Retiring President.

Mr. Taylor, on taking the chair, said his first duty was to move that the best thanks of the members be tendered to Mr. Wellens for the services he had rendered during his term of office. As they were no doubt aware, Mr. Wellens was one of the founders of the Association, and throughout its ten years' existence he had been among its most active members. A noticeable feature of the period during which Mr. Wellens had occupied the chair was the remarkable development of the Junior Gas Association movement; and he had the satisfaction of knowing that the Manchester Association had not only increased in membership, but in usefulness to those connected with it.

Mr. D. O. Hollingworth seconded the motion, which was carried with much enthusiasm.

Mr. Wellens, in responding, said he desired to acknowledge the cordial support which had been given to him by the members of the Council and the executive officers.

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## INAUGURAL ADDRESS.

The President began by thanking the members for electing him to fill the position he was then occupying in the Association, and then paid a tribute to the excellent work done by their representatives on the Council. Referring to two recent innovations —the meeting in Liverpool and the Tuesday evening "coffee" meetings—he said the former was so successful that he hoped, in justice to those of the members who came from the neighbourhood, at least one meeting would be held there every session in future. With regard to the Tuesday evening meetings, they had been so useful in encouraging diffident members to freely express their views (the speeches being unreported), that they also would form an important portion of the future programmes. He thought the good attendance at these gatherings was evidence that the "Journal" had been mistaken in saying the Junior Associations held too many meetings. Mr. Taylor next referred to the fact that he was the third of Mr. Tim Duxbury's one-time assistants who had occupied the presidential chair, and testified to that gentleman's interest in the junior movement. He expressed satisfaction at the success of nineteen of the members in obtaining senior positions, and alluded in appreciative terms to the two joint gatherings of Junior Associations held in Manchester and London, as showing the vigour of these organizations. He then dealt with the following topics.

Carbonizing systems have undergone great changes during the last twenty years, and undoubtedly even greater changes are in store. It is most important that members of Junior Associations should carefully study all the published information that they possibly can respecting vertical retort systems and coke-ovens. It is impossible to predict which of the two methods will finally yield the best and most economical results; but either of them will effect a considerable displacement of labour, a greater yield of gas per unit of coal, and consequently a decrease in manufacturing costs. I am very pleased to find we have a Lancashire Gas Engineer and a Lancashire Town Council who are prepared, after careful consideration, to erect the first large installation of vertical retorts in this country on Messrs. Woodall and Duckham's system—I refer to Burnley. This system effects what has always been the dream of gas engineers—that is, continuous carbonization. More than ninety years ago, Clegg was engaged on this problem; but, unlike so many of his other inventions, his process yielded no very successful results. Mr. Leather, in his admirable report, points out that, taking a not too favourable estimate, the cost of producing 1,350,000 cubic feet of gas in vertical retorts will be £24 per day, against £36 per day in inclined retorts. When to this is added the saving in money, not to speak of trouble and anxiety, due to the absolute freedom from stopped ascension-pipes, pitched hydraulics, and last, but not least, naphthalene, the advantages in favour of verticals appear very considerable. I hope, and with considerable confidence, that Mr. Leather's decision will be thoroughly justified, and also that when the plant is working with the success anticipated he will not forget the juniors in the gas profession, but will invite our Association to Burnley to inspect and admire the plant. Sunderland has decided to instal Dessau vertical retorts; and a comparison of the results obtained by them and by the Burnley retorts will be keenly looked forward to by the whole of the gas industry. I would once again emphasize the necessity to our members of studying these systems as thoroughly as possible.

I have had some little experience with retort-house governors, and can confirm, to some extent, the good opinions which have been so freely expressed about them. At the same time, I believe the most important work they have done has been to render more practicable the reduction of the amount of seal in the hydraulic mains, and also to direct so much attention to the question of careful and equal adjustment of dip-pipes. The statements that as much as 2000 cubic feet additional gas per ton of coal, together with a higher candle power, have been obtained by the use of these governors, should be taken "with a grain of salt." These figures certainly have been obtained where bad working existed in the past; but they are due to three principal reasons—viz., governor + equal dips + lessened dips; and it is very difficult to say which of the three is the most important factor in obtaining the great benefits which have been obtained. Attention to these points has enabled me to increase the production of gas at Mossley by upwards of 800 cubic feet per ton, with the maintenance of the same illuminating power. As this means a saving of about 1000 tons of coal per year, together with reduced working expenses, it forms no inconsiderable item for a comparatively small works such as ours.

Many gas managers are occasioned considerable anxiety and trouble by excessive back-pressure from their purifiers. As a very great sufferer for the last eight years from this trouble, which was caused principally by the small capacity of the purifying plant, I can very strongly recommend the system first adopted, I believe, by Mr. Ogden at Blackburn. It consists in taking the inlet-pipe in the purifier half-way up the box, and sending the gas in two streams—one passing upwards and one downwards—each through equal thicknesses of material. I have been able to run the purifiers longer at Mossley, and have reduced the back-pressure no less than 8 inches, by the introduction of this system. I can specially recommend it for use in lime purifiers, as no form of "hurdle" or other special grid with which I am acquainted can be used for lime; whereas this simple method gives excellent results. At Hollinwood, I was able to use about 25 per cent. more material in the lime purifiers, and at the same time obtained a reduction in the maximum back-pressure of about 9 inches. The cost of altering a purifier is trifling, and it can easily be effected between the times of emptying and refilling.

Owing to some trouble with a holder continually "sticking" when supplying the governors, and the consequent risk to the town's supply of gas, I obtained a pressure alarm to make a contact on an electric bell circuit whenever the pressure fell below a minimum amount on the governor inlet-main. As I was unable to throw the holder out of action for the necessary repairs, this alarm has proved invaluable, as it gives the attendant warning in ample time to turn on the other gasholder. In fact, I am so satisfied with it, that I now consider it quite unnecessary to obtain a safety governor, which previously I had considered an essential portion of all gas-works plant. Its cost is inconsiderable compared with that of a safety governor, and with a trifling amount of attention its reliability is, I think, even greater.

A matter which has assumed very great importance of recent years is the liability for accidents, particularly in the form of workmen's compensation; and it appeared to me not inadvisable to bring before you a few elementary precautions which are, in my opinion, too often neglected, possibly through being so very elementary. As a gas-works employs labour during the night as well as the day, it seems essential that the place should be well lighted. But in many towns the gas-works are about the most miserably lighted works in the town, and can very seldom be compared with the electricity works for efficient lighting. But it may be said that the one has a single building or block of buildings only to illuminate, while the other has detached, scattered buildings, filled with grimy apparatus, and streets, passages, yards, and large spaces within its boundary walls. These, however, are the very places which need good lighting, to aid good workmanship, to avoid accidents to men and plant, and also to demonstrate that gas can easily overcome such trivial difficulties and give a more satisfactory light than any of its rivals. Though gas engineers often recommend owners of mills, workshops, and similar places to improve their lighting by high-pressure installations, they are not merely content with low-pressure lighting for their own works, but in many places use most inefficient flat-flame burners, and even open pipe ends. There are few gas-works where the gas used for lighting them could not be reduced very considerably by the introduction of modern systems, with at the same time an increase of two or three times the total amount of light. What wasted opportunities there are of advertising the effectiveness and efficiency of modern gas lighting.

A large number of accidents on gas-works arise through defective scaffolding; and these are seldom due to faulty design, but generally to carelessness in construction or to weakness of the materials employed. Overhanging planks forming traps have caused the loss of many a good workman's life; and a look-out should always be kept for these traps, which are, of course, formed by planks being used which are of too great length, and are not fastened by any means. All timber intended for scaffolding and all ladders should be carefully examined; and if any unusual weight is to be carried, they should be properly tested before use. If there is any doubt about the safety of any ladder, plank, putlog, or any other material for scaffolding, a gas manager should never "chance it," but have the doubtful portion immediately cut off. Ladders are easily replaced; and it is better to condemn a score of ladders than run the risk of losing a workman's life.

It seems astonishing how many accidents, and often serious ones, occur through a barrow, a piece of coal, or a weight of some description falling upon and injuring the workmen's toes. And it is equally astonishing how few are the accidents caused by inhaling large quantities of gas, more particularly as mainlayers and other workmen who are exposed to escaping gas always treat the matter so carelessly. It is very seldom one can get a mainlayer, for example, to look upon the bladdering of a gas-main as at all dangerous, unless he has once been thoroughly gassed, and especially by a mixture containing water gas. The only precaution that can often be taken is to insist upon the men leaving the gas-charged atmosphere to get a breath of fresh air before they feel even the slightest effects; and to this end there should be plenty of men to deal with any job involving the possibility of gassing.

Too much carelessness exists in many gas-works regarding lights in what may be called the "danger areas." Unprotected

flames should not be allowed near gasholders or scrubbers, or inside purifier-houses, governor-houses, meter-houses, carburettor-houses, and all similar places. The use of miners' oil-lamps is not advisable, as the gauze speedily becomes defective in gas-works. Electric hand lamps should be provided for works purposes; and it is also advisable, I consider, to supply meter inspectors with pocket electric lamps. This latter precaution is one which is particularly advisable in visiting cotton-mills and many other works, where matches or unprotected lights are in many rooms not permissible.

I do not pretend to have done other than briefly mention a few common-sense safeguards which any gas-works manager or assistant would do well to bear in mind. They are all points which, seemingly trivial and elementary in themselves, have, when neglected, resulted in the loss of a valuable life, or even in a serious disaster such as has too often occurred, involving, it may be, a score of lives. I do not wish to encourage timidity, as the timid man causes far more accidents than even the careless one; but a careful man will endeavour to prevent all that ordinary human foresight can prevent.

I have spent some little time in looking through the excellent "Analyses of Accounts" for the past year published by the "Gas World;" and I would strongly recommend others to do the same. Though it may at first sight appear a rather dry exercise, it is undoubtedly a very profitable one; and, moreover, it becomes exceedingly interesting. The figures I wish to call your attention to are some comparisons between gas undertakings in various towns in Lancashire and Yorkshire of similar size to that at Mossley. The gas made in these towns varies from about 90 million cubic feet per annum to about 150 millions; the make at Mossley being 126 millions. The figures are mostly concerning distribution statistics. The unaccounted-for gas varies in these towns from 3·5 to 12·6 per cent.; Mossley's figure being 9·4 per cent. The figures are no more in Mossley's favour when the leakage per mile of main is observed; the highest being 313,700 cubic feet, the lowest 101,200 cubic feet, and Mossley 268,636 cubic feet. The consumers per mile of main vary from 218 to 115; the latter figure referring to Mossley, and thus accounting, to some extent, for the figures obtained in the previous comparisons. The consumption per consumer is very much in Mossley's favour; the variation being from 15,200 to 22,300 cubic feet—the latter figure referring to Mossley. The distribution costs range from 1·94d. to 5·66d. per 1000 cubic feet of gas sold; the latter figure again referring to Mossley. Manufacturing costs range from 11·19d. to 15·6d. per 1000 cubic feet; Mossley's figure being 15·04d. Capital charges range from 8·64d. to 32·19d. per 1000 cubic feet; the lower figure being Mossley's. One cannot but feel considerable compassion for a gas undertaking which is compelled to pay 2s. 8d. per 1000 cubic feet on account of capital charges; and the manager of it is to be congraulated on the fact that he is able to sell gas at 3s. 9d.

The calculations I have made as a result of the preceding comparisons are shortly these: The Mossley gas undertaking supplies the borough of Mossley and the urban district of Saddleworth. Of its 48 miles of mains, upwards of 30 miles are in the latter district. From the gas-works there is a line of main for a distance of eight miles in one direction through Saddleworth, while branch mains extend to as much as three miles from this trunk. It follows that the cost of the maintenance of the Saddleworth mains is a very considerable proportion of the total, as almost all the Mossley mains are within two miles of the works. Unaccounted-for gas is heavy in the Saddleworth district; meter inspection is expensive; and repairs are costly and difficult to effect as promptly as is desirable—these things being due entirely to the straggling character of the district. The heavy distribution costs are two to three times as much as would be considered reasonable under different conditions, but were rather inflated by some special expenditure during the year. The consumption per consumer for the separate districts is: Mossley, 20,080 cubic feet; Saddleworth, 25,921 cubic feet. The higher figure is due to the number of mills using gas in Saddleworth. In Mossley, many of the mills use electricity, generated chiefly by their own plant. As I showed by the table of costs obtained for the discussion with the electrical students, these mills actually pay much more for lighting with their own electric plant than do the mills which use gas. To return to the figures. The consumption per mile of main in the two districts is: Mossley, 3,408,061 cubic feet; Saddleworth, 1,760,913 cubic feet—the latter being an exceptionally low figure for so large an area. The unaccounted-for gas, based on mileage of mains, I estimate as 4,435,000 cubic feet in Mossley and 7,392,000 cubic feet in Saddleworth. As I have taken no account of the heavier pressures in the greater portion of the Saddleworth mains, it is probable that the latter figure would be found too low.

The President said he regretted that, owing to want of time, he had only been able to touch the fringe of the subjects he had dealt; and he concluded by expressing the hope that the Association would have a most prosperous year in every way that could further the interests of the members.

Mr. C. Woodhead (Manchester) in proposing a vote of thanks to the President, said he thought Mr. Taylor had nothing to apologize for, as he had certainly given the members some very good ideas and points to reflect upon, especially in the matter of retort-house governors and the results of experiments in dealing with the trouble arising from back-pressure from the purifiers. He agreed with Mr. Taylor that, generally speaking, the lighting of gas-works was bad, and the cause of many accidents.

Mr. C. Berry (Hyde) seconded the motion; and it was carried unanimously.

The best wishes of the meeting were offered to Mr. Taylor for success in his new sphere at Mossley.

The President, in reply, said he desired to emphasize what he had stated about retort-house governors and the lighting of gas works. At Mossley, by paying attention to the lighting, they had reduced the cost—taking gas at the selling price—by £60 in a quarter. If this could be done at a small place like Mossley by attention to this apparently trivial point, what would be the saving in the case of larger works?

The business of the meeting then concluded; and a smoking concert followed.

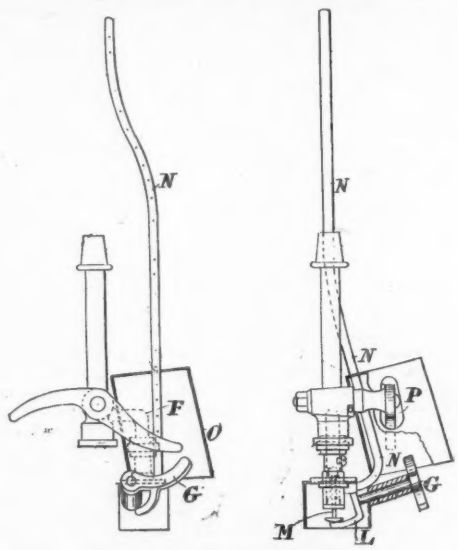
# REGISTER OF PATENTS.

## Lighting Incandescent Gas-Burners.

Lewis, John, of Newcastle-upon-Tyne.

No. 18,424 (of 1907); March 16, 1908.

This invention is particularly applicable for lighting street-lamps—the object being to provide a combination of known parts which "render the lighting of the main burner more easy, more rapid, and less wasteful of gas and mantles than heretofore." The invention is distinguished by the fact that, upon the application of the lighting torch to the operative parts the latter are of such a nature and so arranged that first the bye-pass valve is fully opened quickly, and during the remainder of the application the main valve is gradually opened to its fullest extent. Upon the withdrawal of the torch, the bye-pass valve is closed, just as is the case in the known arrangements wherein the main and bye-pass valves are simultaneously opened during the application of the torch.




Lewis's Street-Lamp Lighter.

The gas-supply pipe is connected to the main gas-supply cock; and the latter is surmounted by the gas-nipple on which is mounted a bunsen tube and burner. The main cock is provided with a plug having mounted on it a double-armed lever, the right-hand end of which is adapted to be raised by the torch of the lamplighter to open the cock to the burner. The bye-pass valve consists of a ball mounted within a casing connected to the casing or barrel of the main cock by a pipe F. The bye-pass valve is operated by a weighted lever G, the fulcrum of which is mounted in a bearing or bracket forming part of a casing surrounding the lower part of the bye-pass valve casing. Within the casing is a lever arm L, adapted to come into contact with the weighted push-rod M, which (when raised by the action of raising the lever G by means of the lamplighter's torch) causes the ball in the bye-pass valve casing to be raised off its seat and permits gas to flow from the main cock, by the pipe F, to the climbing pilot burner, or the bye-pass N to the main burner. The torch, when inserted in the guiding and flame-protecting casing O, after raising the lever G and opening the gas-supply valve, also raises the lever of the main valve (which projects through a slot P in the casing O), with the result that the gas issuing from the small holes all the way up the climbing bye-pass or pilot burner is ignited and finally ignites the main burner. On withdrawing the torch, the lever G falls and the bye-pass valve is automatically closed.

## Prepayment Gas-Meters.

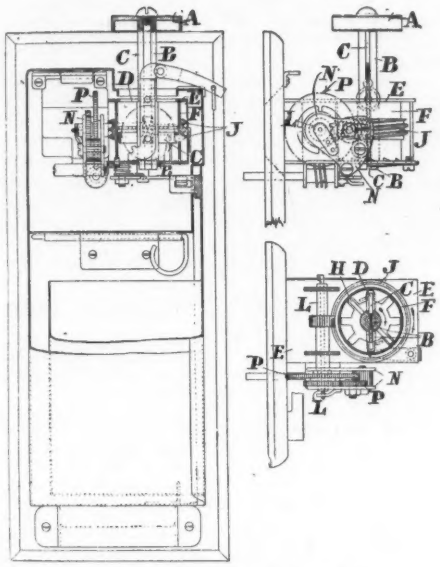
Parnham, A. E., of Wavertree, Liverpool.

No. 5171; March 7, 1908.

This invention has reference primarily to prepayment gas-meters with the object of providing means for locking the coin receptacle by hand-operated mechanism.

The mechanism for automatically controlling the meter valve is shown in part sectional elevation and side elevation and plan.

The hand-actuated part comprises a handle A and a stem portion B



Parnham's Prepayment Gas-Meter.

having a slot C formed in its length. When in its normal position, the slot C coincides with a slot D in a plate E, through which the stem portion passes. Below the plate E, and concentric with the stem B, is a barrel or cage F, having teeth or serrations in it, adapted to engage with a coin after the latter has been inserted in the slot C and dropped through the slot D into the barrel, and to effect engagement between the stem and barrel and lock the two together. The partial revolution of the hand-operated part also partially rotates the barrel until the slot in the stem B coincides with a slot H in a lower plate. When this is effected, the coin is allowed to fall into a drawer arranged in the lower part of the casing.

The barrel is provided with a worm J, which engages with a worm wheel on a hollow shaft L, and encloses a spindle which is preferably disposed concentrically therein. On the shaft L is mounted a setting mechanism, which comprises plates N and a train of gearing (part of which is interchangeable) carried thereby; the plates being free to rotate on the shaft and serving to support part of the gearing thereon. To these plates is connected the supply valve of the meter, through the medium of a rod or its equivalent (not shown).

A toothed wheel, forming part of the train of gearing, is fixed to the hollow shaft, and another toothed wheel P, mounted concentrically to it, is free to rotate relatively of the shaft; the respective wheels being adapted to operate the plates N, through the other part of the gearing carried between them, for opening and closing the supply valve.

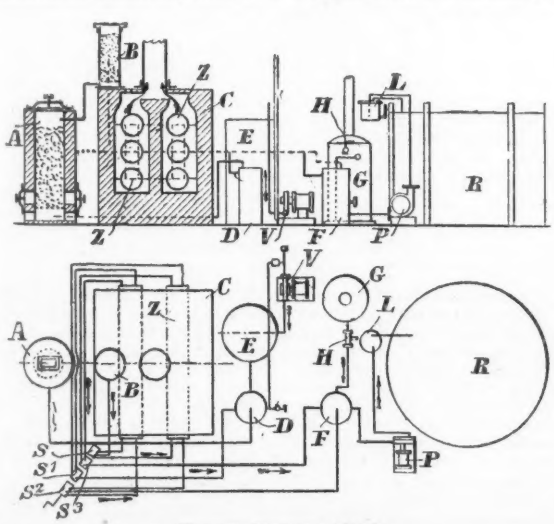
The mechanism is enclosed in a casing provided with a removable lid or cover having a receptacle for the coins placed in the machine, and adapted to engage with a spring-controlled toothed plate pivotally mounted to the under surface of the lower plate. The disengagement of the cover from this toothed plate is effected by means of a key adapted to be inserted in the coin-receiving slot of the stem.

## Production of Hydrogen.

VIGNON, L., of Lyons, France.

No. 6347; March 21, 1908.

This apparatus is for the manufacture of hydrogen for lighting, heating, and other purposes, by a method based on separate and alternate reactions simultaneously carried out in separate retorts at suitable temperatures and in suitable proportions—on the one hand, of steam upon divided iron to form hydrogen, and, on the other hand, of a reducing gas or poor gas upon the oxide of iron (the iron being regenerated and utilized in another operation).



Vignon's Hydrogen Plant.

The apparatus comprises a generator A supplied with air alone and serving to produce the poor gas without hydrogen ($CO_2 + N$). The generator is charged with coke through the top. The gas produced passes off to a purifier B filled with a mixture of iron and oxide of iron capable of arresting sulphurous gas and dust. The purified gas passes from B to a distributing valve S, for the poor gas produced in the generator. The furnaces C contain the retorts Z. The carbonic oxide acts in the retorts which contain oxide of iron ($Fe_3O_4$) to effect the above reaction and regenerate the iron, liberating carbonic acid. The poor gas, composed largely of carbon monoxide, is distributed to these retorts in which the reduction is to take place, by means of pipes shown in the plan. The carbonic acid formed in the retorts is led away to the distributing valve $S^1$, whence it passes to a heat interchanger D. The carbonic acid thence passes into a pipe fitted with a regulating valve and serving for discharging or leading the gas away.

The heat interchanger serves for heating the air to be supplied to the generator; the delivery of air being regulated by the gasholder E which forms an air-reservoir, to which air is supplied by a fan V driven by an electric or other motor.

Steam, produced in a boiler G, is led to a reducing-valve H, or other suitable device, which considerably reduces its pressure; and thence it passes into a heater F, where it is heated by the hydrogen generated (as about to be described) in the series of retorts in which the oxidation is effected. The steam passes on from the heater F to the valve $S^2$, and thence by pipes to the retorts, in which oxidation is effected.

In these retorts hydrogen is liberated and passes away to the hydrogen distributing valve $S^3$. From this valve the gas is led through the heater F to the exhauster P. In the heater F it heats the steam from the reducing valve H, as before explained. From the exhauster the hydrogen passes to the seal-chamber L and holder R, after passing, if necessary, through a washer (not shown). The seal-chamber L serves to prevent the return of the hydrogen from the holder to the apparatus. From the holder R the hydrogen is sent into the supply main; but, if necessary, it may first be enriched by benzene vapour to give it illuminating power.

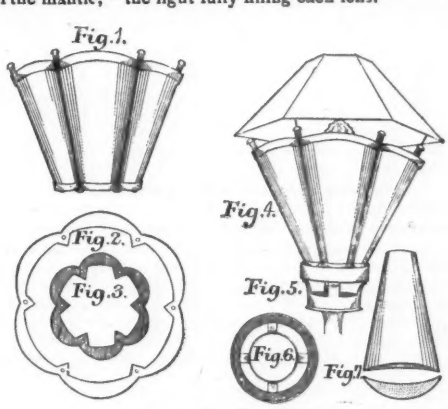
## Street Lamps or Lanterns.

SPARKS, H., of Hastings.

No. 7240; Sept. 22, 1908.

The inventor proposes to employ a number of separate periscopic or concavo-convex lenses (of which the sides may be either straight or tapered) so mounted in a frame or holder that any one of the lenses may, in the event of breakage, be replaced.

In the case of inverted incandescent gas-lamps, the receptacle or cup is dispensed with, and a disc-shaped lens, either concavo-convex or plano-convex, is substituted where necessary, so as to give a downward light—thus forming a combination of lenses. The upper part of the holder or frame is clamped to the already existing fitting. With incandescent gas-lamps, the tapered lenses (as shown) are said to extend the light of an ordinary mantle to double the width, and are fully the length of the mantle, "the light fully filling each lens."




Sparks' Lamp Lenses.

Fig. 1 shows a side elevation of the body of a lantern formed by arranging a series of periscopic lenses in a frame or holder. Figs. 2 and 3 show plans of the upper and lower lens holders, which are turned over outwardly to secure the lenses, and bolted top and bottom with rods or bands. Fig. 4 shows a complete lamp or lantern with all its component parts at a greater angle—the lenses being decreased at the lower ends. Fig. 5 shows a side elevation of the receptacle or cup which keeps the lenses in position, and is permanently lodged and grips on the projection of the burner. The upper band encircles the lenses, which can be lifted off bodily for cleaning purposes. By using cups having wider or narrower openings, the light can be regulated to the required angle of the lenses. Fig. 6 shows a plan of the cup. Fig. 7 illustrates a periscopic tapered lens.

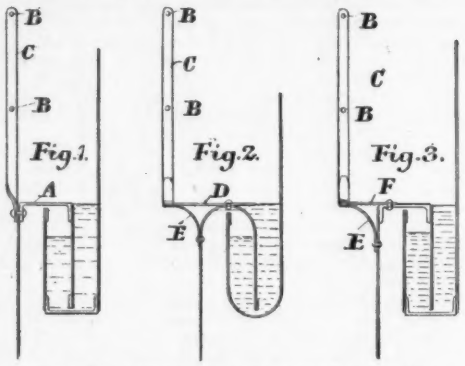
## Spiral-Guided Telescopic Gasholders.

CUTLER, SAMUEL, of Millwall.

No. 9570; May 2, 1908.

In a telescopic gasholder, the patentee points out, the several cylindrical sections or lifts of which it is composed are connected together by water-sealed joints; and it is very desirable that these should be reasonably accessible for examination and clearing from ice or other obstructions. Also the guide-carriages are arranged at this part of the structure, and ready access to them for adjustment, oiling, &c., is desirable. In holders having external guide-framing, this framing

forms a suitable basis for the attachment of ladders or other devices by means of which the cups and grips and the guide-carriages may be reached. But in spiral-guided holders there is no external guide-frame, and to obtain access to the water-joints and guide-carriages when the holder is inflated is "difficult and often dangerous."




**Cutler's Railed Platform for Spiral-Guided Gasholders.**

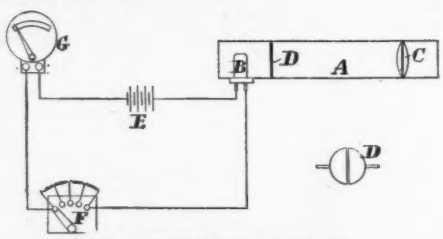
The inventor proposes to encircle the entire circumference of each water-joint with a platform and guard-rail, as shown. A (fig. 1) is the grip-channel utilized as a platform, and B the guard-rail supported by the standards C. Where the grips are of bent plate instead of channel bar, a separate platform (fig. 2) is provided, carried on brackets E. In some cases, the width of the "walking-way" upon the channel grip may be extended by affixing a platform F (fig. 3). The platforms may be reached by the permanently-attached vertical ladders usually provided on such holders, or by a spiral stair or lift, or other equivalent device, arranged adjacently to the holder.

## Pyrometers.

DIXON, A. W., and MIDDLETON, E. (Messrs. John Brown and Co., Limited), of Sheffield.

No. 13,360; June 23, 1908.

The object of this invention is to provide apparatus by which high temperatures of glowing bodies can be very accurately ascertained or measured—of the kind in which the radiation from the hot body is focussed by means of a lens upon the indicating element. The patentees use a cell of selenium or other light-sensitive substance as the indicating element in their pyrometer.




**Dixon and Middleton's Pyrometer.**

The apparatus consists of a tube A provided with a sensitive cell B of selenium, a collimating lens C, and a slotted diaphragm D (shown separately) for the direction of the projected rays on to the selenium. A current of electricity is passed from the battery E through the cell, and in the circuit is included a switch and rheostat F and a galvanometer G (or other suitable indicating or recording instrument) acting to indicate or record the resistance of the selenium, and, consequently, the temperature of the body from which emanate the rays of light which enter the tube A.

## Spirally Guided Gasholders.

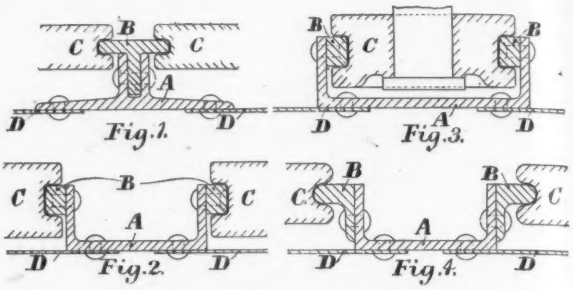
HENRY BALFOUR and CO., LTD., BARKER, J., and HUNTER, J., all of Leven, N.B.

No. 14,884; July 14, 1908.

This invention "has for its object to employ improved guides whose foundation flanges are directly attached to the gasholder plates."

Fig. 1 is a section of a spiral guide rolled with an opening in which a T-iron can be placed between the jaws and riveted to it. Fig. 2 is a spiral guide formed of ordinary channel iron with two flats riveted to it, to take the guide-wheels. Fig. 3 shows a guide similar to fig. 2, but having the flats on the inside—being for use with a single guide-wheel. Fig. 4 is a guide similar to fig. 2, but having angle irons on the outside.

The holder would be made in the usual manner, with the guides riveted to it at an angle of 45°. In fig. 1, the guide is formed of two parts—viz., the foundation A and the T-iron B riveted to it. The guide-wheels C bear against the edges of the T-iron, as shown. The plates D of the holder are riveted to the foundation. In fig. 2, the foundation A consists of an ordinary channel to which flats B are riveted on the outside; the guide-wheels C engaging with such flats. In fig. 3, the flats are riveted to the inside of the channel—thus allowing of one guide-roller C being used, instead of two. In fig. 4, angle irons B are used instead of flats; these being riveted on the outside, as shown. Sometimes, instead of riveting angle irons to the channel, it may be rolled with projecting lips, so that the section will be approximately like fig. 4, but in one piece instead of three.




**Balfour, Barker, and Hunter's Spiral-Guided Holders.**

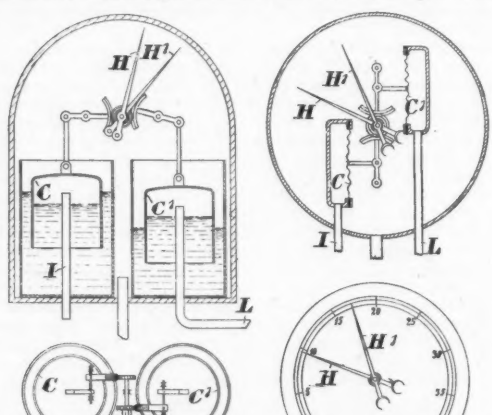
It has already been proposed to use spiral guides of various types. One form of spiral guide consists of diagonal or spiral plates, by preference of greater thickness than the ordinary gasholder plates; and to these plates are attached the spiral guide-rails, while the whole is strengthened by internal upright stiffening rails. In another type, the roller guide-rails have been made of trough formation with inwardly projecting parts, so as to retain the rollers which have plain faces. These guide-rails may be made of a section in one piece, to which the holder plates are directly attached, or in two pieces riveted to a foundation plate; and an external protuberance may be attached to it for the purpose of carrying away water. In yet another type which is used with two adjacent grooved pulleys, the rail consists of a combination of a T or H iron supported by two angle irons to which the gasholder plates are attached; the T-irons and the angle-irons being further strengthened by a back-plate or T-iron attached to the two angle-irons.

## Gas-Pressure Indicators.

SCHULTZE, P., GAEHDE, T., and DOSCH, A., of Charlottenburg.

No. 17,116; Aug. 14, 1908.

According to the present invention, gas pressures above or below a standard are indicated by only one scale. The construction shown represents two inverted glass bells C and $C^1$, which dip into a fluid.




**Schultze, Gaehde, and Dosch's Pressure-Indicators.**

The movement produced by the pressure exerted on these bells is transmitted to the hands H $H^1$ by a system of links. The hands rotate around the same spindle or axis. The casing is hermetically closed and connected with a source of any desired standard pressure. For instance, the gas-tube I of one bell is brought into connection with a higher pressure, while the other bell is connected through L with a lower pressure than that existing in the casing. The bells or membranes will, therefore, make contrary movements. The arrangement is made in such manner that the different coloured or otherwise distinguished hands which rotate around the common axle centre turn in the same direction, and show on the same scale the absolute pressure below or above the standard pressure.

## Feeder for Bucket-Conveyors.

WEST, J., of Manchester.

No. 10,798; May 18, 1908.

This invention relates to a mechanical feeder for supplying materials in measured quantities from hoppers or stores to bucket-conveyors, elevators, and the like. It has for its object the regulation of the supply, and ensures the maximum quantity being supplied "without incurring the risk of overloading the conveyor or elevator;" and, further, "as this regulation of the supply permits of the conveyor being supplied with the maximum quantity of material that may be safely transported, a given quantity of material may be conveyed or elevated in a shorter period of time than would be the case if the elevator was irregularly fed—as, for example, from hoppers having a hand regulated, or even a mechanically operated, slide-door which increases or decreases the area of the opening through which the material flows." Such sliding-doors, the patentee remarks, require constant attention to regulate the size of the opening to suit the varying classes of material—as, for instance, coal, which may be fine, wet, or dusty, large or small, "each kind requiring the area of the opening

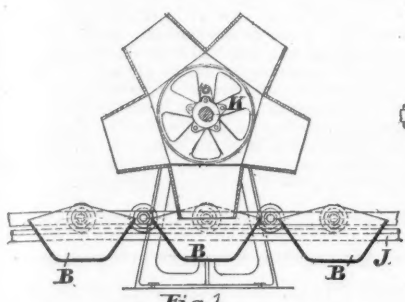


Fig. 1.

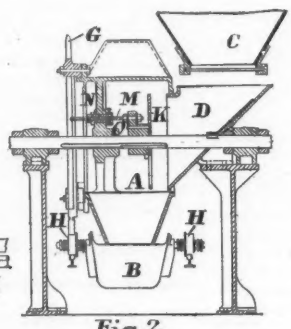


Fig. 2.

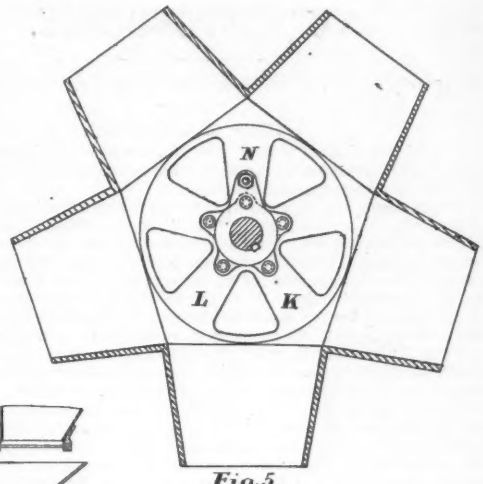


Fig. 5.

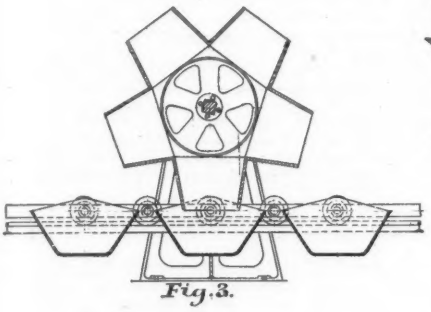


Fig. 3.

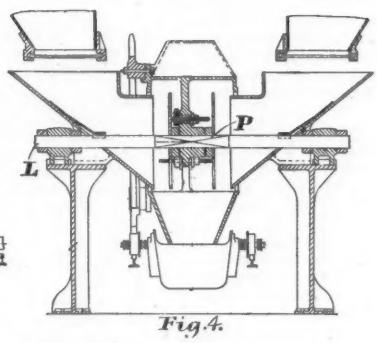


Fig. 4.

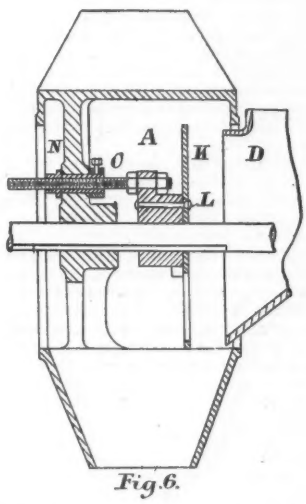


Fig. 6.

West's Feeder for Bucket-Conveyors.

to be varied unless the opening is set at such an area that it will only permit of the passage of such quantities of the easiest flowing material as will not choke or overflow the conveyor."

The invention consists of the application to a rotary filler of a plate or plates with openings through which the material passes on its way from the hopper supply to the conveyor buckets; the plate or plates being attached to the shaft of the filler and rotating it. Consequently, the material is kept in motion when the conveyor is working. The area of the opening in the plate or plates is constant; but the total area through which the material passes may be increased or decreased by the amount of space between the side or face of the plate and the face or edge of the feeding-shoot from the hopper—this space being increased or decreased by adjusting the plate laterally along the shaft by adjusting screws and nuts, so arranged that the length of the screw outside the adjusting nuts will correspond with the space between the plate and the shoot, and thus indicate the amount of space between the edge or face of the shoot and the plate.

Figs. 1 and 2 are sectional elevations of a rotary filler for a gravity-bucket conveyor, fitted with one adjustable regulating plate or disc, arranged to be fed from a receiving hopper at one side only. Figs. 3 and 4 are sectional elevations of a rotary filler for a gravity-bucket conveyor, fitted with two adjustable regulating plates or discs, and arranged for being fed from receiving hoppers on both sides. Figs. 5 and 6 are enlarged sections of a rotary filler body showing the plate or disc with regulating screw and nut.

Referring to figs. 1, 2, 5, and 6, A is a rotary filler with spouts for filling the gravity buckets B; the material being fed to the filler from the hopper C through the shoot D. The filler is fixed to the shaft L and rotated, in bearings supported on stands, by the sprocket wheel G driven from the conveyor chain rollers H, which run on rails. K is the adjustable plate or disc with openings whose centres are arranged for preference to come on the centres of the filler spouts. The plate K is provided with a boss having a feather-way, which enables the plate to be adjusted laterally along the shaft L on a feather fitted into the shaft and causing the plate to revolve with the filler and the shaft. The plate K is adjusted laterally on the shaft L by means of the screw M fixed to the plate and operated by means of the nut N which is fitted into one of the filler arms. It is free to revolve, but is held in position by the collar O; the plate being moved by this means either towards or away from the edge of the shoot D to suit the required flow of material through the filler. It is so arranged that the amount of opening can be readily measured by making the screw of such a length that the amount protruding beyond the nut will correspond with the space between the plate K and the edge of the shoot D.

Figs. 3 and 4 show an arrangement of filler with two adjustable plates or discs arranged for being fed from either hopper through shoots. The filler body is fastened on a square P on the shaft L, and the adjustable plates or discs are moved laterally along the square by means of screws operated by nuts fitted into the arms of the filler body and free to turn in it, being held in position by collars. The length of the screws projecting on the side remote from the discs is made equal to the distance between the discs and the vertical faces of the shoots.

## Incandescent Gas Lighting Bodies.

UNRUH, MAX VON, of Charlottenburg.

No. 17,596; Aug. 21, 1908.

The lighting power of bodies made according to this invention is based on the use of "the known mixture of the oxides of thorium and cerium;" and the object of the invention is "to produce incandescing bodies which are of high porosity and of high lighting power, and which are very resistent to shocks and are very durable."

The patentee remarks that many propositions for the production of such incandescing bodies have been made. It has, for example, been proposed to add to the mixture of thorium oxide and cerium oxide, fire-proof substances, such as asbestos powder (Patent No. 27,269 of 1896), or kaolin, silicium oxide, zirconium oxide, lanthanum oxide, or baryta, admixed with cellulose or fibrous vegetable substances (Patent Nos. 12,105 and 13,638 of 1895). These methods have, it is said, the disadvantage that the masses trickle or run in the burning process and lose their porosity; so that the surface of the incandescing bodies diminishes, and their lighting power is lessened. It has also been proposed to mix organic substances of cellular structure with lighting salts, and to burn the mixture and then add the ashes thereof—preferably after having been sifted—to a solution of lighting salts (Patent No. 14,191 of 1898). In this process no organic substance is present in the formed incandescing bodies, because the organic substances are burned, or reduced to ash, before the solutions of refractory earth are added; and therefore incandescing bodies made in accordance with the patent named "do not contain any organic substances before the final burning, and the consequence is that the incandescing bodies are not porous and are wanting in stability, because they did not contain fire-proof substance."

The process for manufacturing the incandescing bodies according to the present invention is as follows: An organic fibrous substance—such, for instance, as wool, cotton, ramie, cellulose, filtering paper, or fabric—is impregnated with a solution of lighting salts, preferably a mixture of the nitrates of thorium and cerium. The fibrous substance is saturated with the solution and then dried, and afterwards comminuted as thoroughly as possible. Then the comminuted mass is mixed with a fire-proofing material, such as oxide of magnesium (to render the incandescing body stable) and with oxide of thorium (to prevent running or trickling in the incandescing body), and is moistened with water, or preferably with the solution named, and thoroughly mixed. In order to give the mixture binding power, organic binding material, such as sugar (preferably invert sugar), or a gum, or starch, is added and thoroughly mixed with it. The incandescing bodies are then pressed, moulded, or otherwise formed, in filamentary, or other required, form from the mass. Fabrics may be made in the required form, of mantles for instance, from the filamentary material so produced. The mantles or other incandescing bodies are then subjected to sufficient heat to destroy the organic matter and transform the lighting salts into oxides—"thus producing an incandescing body consisting of oxides of thorium and cerium together with a fire-proof material, such as magnesia, but no carbon."

# CORRESPONDENCE.

*[We are not responsible for opinions expressed by Correspondents.]*

## Figures of Coke Sales.

SIR,—I am pleased to find that Mr. Watson's challenge as to coke sales has been taken up, even though the writer hides his identity under the style of a communicated article.

He proceeds to join issue with me on my assertion that it is impossible to sell 13 cwt. or more of "dry" coke, and then goes on to give figures only relating to the possibility of selling 12 cwt. of coke and breeze per ton, in which the average percentage of moisture is somewhere in the neighbourhood of 11, which in this district would be referred to as "drowned" coke. If the writer of the article would for six or twelve months keep a record of the actual quantity of coke, &c., used in his furnaces—including stoppages, gaiting, and slow fires—he would find that his consumption per 100 lbs. of fuel would average very much more than he allows, and that the difference between "dry" and "wet" coke for sale is even more than the 11 per cent. he allows. If, again, he deducts, as he should do, the fuel used for steam-raising and other works' purposes, the quantity for sale even on his figures would not exceed 10½ cwt. to 10¾ cwt. per ton, or if sold on the dry basis of (say) not exceeding 4 to 5 per cent. of moisture would not be very much higher than the figure I gave in my remarks on Mr. Watson's paper—viz., 9·87 cwt. per ton of coal.

In taking his coke at 9·28 per cent. of moisture, your correspondent is very much below a great many gas undertakings; and I am aware of several where the percentage would be much nearer 20. A sample that came into my hands a few months ago was, bulk for bulk, 42 per cent. heavier than Stretford coke, which is practically dry, containing on the average less than 5 per cent. of moisture.

In computing the coke available for sale at Stretford, that used on the carburetted water-gas plant is included, but only for comparison; and I am of opinion that this can be justified, as the coke will be available for sale if the plant is shut down, whereas that used for boiler fuel, &c., is not so.

I am quite agreed with the writer of the article that it is impossible to ascertain the absolutely correct make of coke; but it can be obtained with sufficient accuracy if a record of all used in the retort-house, boilers, and other plant is kept. Such figures are invaluable in checking the fuel used, and have during the past twelve months at Stretford resulted in a marked improvement in the actual quantity of coke sold. I am also agreed with the writer of the article that it would be better if the coke breeze and pan breeze were kept separate in the returns; but I suggest that the figures should be the quantities actually sold, with separate columns for the quantities used in carburetted water-gas plant. We should then have a basis of comparison that would be useful, instead of the present most unreliable method; and the huge sales of over 13 cwt. per ton would for ever disappear from all returns.

We in the North are not envious of our brethren in the South, with their big sales, because our position is that these returns are not actual sales; and if they should be, it is because the coke is so saturated with moisture as to be largely useless for firing purposes, except at a low price. It would be interesting to have, in parallel columns, the weight of coke and breeze sold per ton, and the average price per ton received, of all companies in and around London. I think we should find that the undertakings that returned the largest makes would be in receipt of the lowest average price.

*Stretford, April* 3, 1909. H. KENDRICK.

## Testings for Calorific Power.

SIR,—With reference to the calorific value of town gas, it may be of interest to state that testing for forfeiture has been regularly carried out by the writer since October, 1906, on behalf of the District Councils whose areas are supplied with gas by the Tottenham and Edmonton Company.

The standard of calorific value was fixed, by agreement, without statutory enactment; and the penalty for non-fulfilment is recoverable without recourse to a Court of Summary Jurisdiction.

*Tottenham, March* 31, 1909. ARTHUR E. BROWN.

## A Disclaimer.

SIR,—With reference to the paragraph in your issue of March 30, under the heading of "A Tempting Letter," which you state is signed by P. Williams, Secretary, as I was for some years Secretary to the late Toddington Gas Company, Limited, and seeing the striking similarity in the two names, I should be glad if you would kindly spare a line in your next issue to state that I am in no way whatever connected with either of the undertakings now in question.

21, *Wharf Road, City Road, N., April* 1, 1909. F. WILLIAMS.

## Town Gas v. Suction Gas for Power.

SIR,—I notice in your issues for the 2nd and 23rd of March you report from the proceedings of the Maldon Town Council the adoption of a suction-gas plant at their Spital Road station, owing to the results achieved by replacing a steam plant by a suction-gas plant at their Wantz Road station. I should like to point out that the results referred to were achieved by town gas supplied by my Company at 2s. per 1000 cubic feet, and not by suction gas as you state, and they were obtained by an engine of 15 B.H.P. running 12 hours a day for 2s. 1½d. per day. The repairs to this engine have been practically *nil;* and the attendant locks up and goes away for hours together, to attend to his other duties of turncock, main and service layer, &c.

In face of these results, the Maldon Town Council have decided to put in a suction-gas plant at their Spital Road station, apparently on the advice of one of the firms who were unsuccessfully tendering for the supply of this plant, which firm guaranteed a saving to the Council of 50 per cent. over the cost of town gas at 2s. per 1000 cubic feet, though they recommend an engine of 17 or 18 B.H.P., when one of 12 H.P. running with town gas would do the necessary work. This is, of course, utterly absurd; and I only mention it to show the kind of influences which are brought to bear on authorities of this sort. What I really complain of is that my Company were not even invited to state their case; and the whole thing was settled before we knew anything about it. I need not say that, in face of Mr. Paterson's Presidential Address to the Southern Association, in which he quotes Mr. T. Duxbury as saying that "gas at 2s. per 1000 cubic feet should be in no fear of being ousted by producer gas," we are a little disappointed.

*March* 25, 1909. A. L. CLARKE, Engineer, Maldon Gaslight Company, Limited.

# PARLIAMENTARY INTELLIGENCE.

## HOUSE OF LORDS.

The following further progress has been made with Bills:—

Bills brought from the Commons, read the first time, and referred to the Examiners: Conway Gas Bill, Eastbourne Gas Bill, Littlehampton Gas Bill.

Bills read a second time and committed: Alliance and Dublin Consumers' Gas Bill, Leyland and Farington Gas Bill.

Bills reported, with amendments: Bungay Water Bill, Donington Water Bill, Frimley and Farnborough District Water Bill, Grantham Water Bill, Wells Gas Bill.

Bills read the third time and passed: Clevedon Water Bill, Heckmondwike and Liversedge Gas Bill, South Lincolnshire Water Bill.

The Salford Corporation Bill has been referred to a Select Committee, consisting of the Duke of Devonshire (Chairman), Viscount Hill, Lord Ramsay, Lord Hindlip, and Lord Monk Bretton; to meet on Tuesday, the 27th inst.

The Lisburn Gas Bill, Lisburn Urban District Council Bill, Pontypool Gas and Water Bill, and South Staffordshire Water Bill have been referred to a Select Committee, consisting of Lord Ribblesdale (Chairman), the Marquis of Bath, Lord Saltoun, Lord Kenyon, and Lord Weardale; to meet on Tuesday, the 27th inst.

## HOUSE OF COMMONS.

The following further progress has been made with Bills:—

Lords' Bills read the first time and referred to the Examiners: Clevedon Water Bill, Heckmondwike and Liversedge Gas Bill, South Lincolnshire Water Bill.

Bills reported, with amendments: Gaslight and Coke Company Bill, Northallerton Water Bill, Swinton and Mexborough Gas Board Bill, West Gloucestershire Water Bill.

Bills read the third time and passed: Conway Gas Bill, Eastbourne Gas Bill, Littlehampton Gas Bill.

Mr. W. Thorne has given notice, on the consideration of the Gaslight and Coke Company Bill, to move its rejection.

The Cardiff Corporation Bill, Glamorgan Water Board Bill, and Pontypridd Water Bill have been referred to a Select Committee, consisting of Sir Luke White (Chairman), Mr. Fell, Mr. Alden, and Mr. Nolan; to meet on Thursday, the 22nd inst.

The Ammanford Gas Bill and the Derwent Valley Water Board Bill have been referred to a Select Committee consisting of Mr. Arthur Stanley (Chairman), Mr. A. G. C. Harvey, Mr. Du Cros, and Mr. Glover; to meet on Tuesday, the 27th inst.

Sir William Holland has brought in a Bill "to confer the municipal franchise upon mercantile corporations and companies." It is backed by Sir Clifford Cory, Sir Henry Kimber, Mr. Robert Balfour, and Mr. Holden.

Mr. Armitage asked the Chancellor of the Exchequer last Wednesday whether, seeing that co-operative societies are exempt from income-tax because the individual incomes of the shareholders rarely exceed £160 per annum, he will extend the same privilege to the trading profits of municipal corporations, seeing that the bulk of the ratepayers, for whose benefit the profits are made, have incomes below the income-tax minimum; but Mr. Lloyd George replied that he did not see his way to taking the course suggested.

The next day, Mr. Carr-Gomm asked the President of the Local Government Board whether his attention had been drawn to the protracted delay in repairing the roadway of Grange Road, Bermondsey, which was damaged by the sewer explosion in December last, and whether he had communicated with the Borough Council on this subject. If so, could he state what had been the cause of the delay. Mr. Burns, in reply, said his attention had not been previously called to any alleged delay in repairing the road in question, but he would make inquiry on the subject.

Last Friday Captain Morrison-Bell asked the President of the Local Government Board whether he would amend the Water-Works Clauses Acts so that an Urban District Council whose water supply is purchased in bulk from another urban district might be able to enforce conditions as to size of flushing-cisterns, &c., in existing houses that would prevent waste or misuse, and so protect the ratepayer from unnecessary expense. Mr. Burns replied that he had not at present in contemplation the amendment of the Acts named with the object suggested.

The Directors of the Imperial Continental Gas Association recommend a dividend of 4 per cent. for the half year ended Dec. 31, tax free; being the same as last year.

## THE GASLIGHT AND COKE COMPANY'S BILL.

### House of Commons Committee.—Thursday, April 1.

(*Before Mr.* J. J. MOONEY, *Chairman, Mr.* CARLILE, *Mr.* J. TAYLOR, *and Mr.* ALFRED KING.)

The Committee to-day had this Bill (see last week, p. 917) before them for the consideration of clauses.

Mr. C. E. C. BROWNE (of Messrs. Dyson and Co., the Parliamentary Agents for the Bill) stated that the only question upon the clauses which he thought would be left for the decision of the Committee, as a matter not settled between the parties, was on a comparatively small point arising upon the clauses which they had agreed with the London County Council. The principal matter that had been agreed with the Council was that there should be a standard of the calorific power of the gas supplied by the Gaslight and Coke Company. Except as regarded drafting amendments, as to which both the London County Council and themselves desired to reserve their position, in case documentary evidence should be necessary to give effect to what they both meant, the clause they had before them was the exact one that had been agreed.

Mr. FREEMAN, K.C , who appeared for the London County Council and the West Ham Corporation, said he quite agreed with the statement with regard to the rest of the clause. It had been an extremely difficult matter to get it into exact technical form ; and they proposed that the wording should be open to either side as to the slight amendments between the House of Commons and the House of Lords.

Mr. BROWNE : The first sub-section will be :

As from the 1st day of January, 1910, the standard calorific power of the gas supplied by the Gaslight Company within the Administrative County of London shall be 125 calories net per cubic foot ; but the Gaslight Company shall not incur any liability in the event of their supplying gas of a calorific power of not less than 112½ calories. Provided that if within one month after the expiration of a period of three years from 1st January, 1910, or after the expiration of any subsequent period of three years, either the Gaslight Company or the controlling authority shall desire that such standard calorific power shall be reduced or increased, and shall give to the other party and to the Board of Trade notice in writing of such desire, it shall be lawful for the Board of Trade, after hearing the parties and considering any representations made to them by either of the said parties, by order, to reduce or increase the amount of the said standard calorific power, and of the deficiency below such standard within which to such extent as to the said Board may seem fit, and the Board may by such order make all such modifications of this section as may be necessary in consequence of any such reduction or increase as aforesaid, and may also direct the manner in which the costs, charges, and expenses of the said parties and of the said Board of and incidental to any such application, and any inquiry held by or under the direction of the said Board in connection therewith, shall be borne. The standard calorific power prescribed by the said order, if made by the Board of Trade, shall, for the purposes of this section, be deemed to be the standard calorific power prescribed by this Act.

Sub-section 2 was as follows :

As from the said 1st day of January, 1910, sub-sections (2), (3), and (5) of section 5 (as to testing for calorific power, sulphur impurities, and illuminating power with flat-flame burners) of the Act of 1905 shall cease to apply or have effect so far only as such sub-sections relate to the calorific power of the gas supplied by the Gaslight Company within the county.

Replying to Mr. Carlile, Mr. BROWNE explained, with regard to sub-section (1), that there was contained in the London Gas Act, 1905, a section requiring the London Gas Examiner to test for calorific power and for certain other purposes the gas supplied by the three Metropolitan Companies ; but under that section no standard was fixed, and no penalties were prescribed, so that they adopted that section 5 as the foundation of the new clause, and made use of the testings which were made under that section, imposing now a standard and now a forfeiture for deficiency. Sub-section (3) was :

One testing only for calorific power shall be made at each testing-place daily; but in the event of the calorific power being on any testing ascertained to be below 112½ calories, the Gas Examiner shall forthwith give notice thereof to the Gaslight Company, and a second testing shall be made at an interval of not less than one hour from the time of making the first testing at that testing-place, and the average of the two testings shall be deemed to be the calorific power of the gas at that testing-place on that day.

Sub-section 4 was :

Section 10 (Company may be Represented at Testings) of the Act of 1880 shall, with respect to the Gaslight Company, be read and have effect as if calorific power were therein referred to in addition to illuminating power, purity, and pressure.

Sub-section 5 was :

Section 13 (Quarterly Report of Chief Gas Examiner) of the Act of 1880 shall, in relation to the Gaslight Company, be read and have effect as if there were added at the end thereof " (4) the calorific power on each day at each testing-place of the controlling authority."

Section 6 read :

Section 11 (Daily Reports and Access to Books) of the Act of 1880 shall, in relation to the testings for calorific power under the said section 5 of the Act of 1905, as amended by this section, apply to, and with respect to, such testings. (7) If on any one day the gas supplied by the Gaslight Company at any testing-place is of less calorific power to an extent not exceeding six calories than 112½ calories, the average of the testings for calorific power made at such testing-place on that day, and on the preceding day, and on the following day, shall, for the purposes of sub-section (8) of this section, be deemed to represent the calorific power of the gas on such one day at such testing-place. (8) The Gaslight Company shall not be liable to any forfeiture for defective calorific power where the calorific power on any day of the gas supplied by them is not less than 112½ calories; but where the calorific power on any day of such gas is less than such last-mentioned quantity, the Gaslight Company shall be liable to the following forfeitures in respect of such deficiency : Where the deficiency does not exceed 3 calories, £5; where the deficiency exceeds 3 calories but does not amount to 6 calories, a sum not exceeding £10; for each complete 6 calories of defective power, a sum not less than £25 and not exceeding £100.

Answering the Chairman, Mr. BROWNE said that in the second sub-section the words "net per cubic foot" went out :

Provided always that the controlling authority of any testing-place, having recovered one forfeiture in respect of defective calorific power in the gas supplied by the Gaslight Company at one testing-place on any day, shall not be entitled to any further forfeiture in respect of defective calorific power in the gas supplied by the Gaslight Company at any other testing-place of such controlling authority on the same day. Provided also that no forfeiture shall be incurred in any case with respect to which it is certified by the Chief Gas Examiner that the defect of calorific power was occasioned by an unavoidable cause or accident.

Sub-section 9 was struck out, and 10 became 9 :

The provisions of section 19 (Forfeitures and Losses from Fraud, &c.), and section 20 (Recovery of Forfeiture, &c., 23 and 24 Vic., Chap. 125) of the Act of 1880 shall extend and apply to forfeitures under this section and to the recovery thereof.

Mr. BROWNE remarked that, dealing with the point upon sub-section 7, it would be seen that this sub-clause provided that in the case of a deficiency of calorific power on any day, the Company might have the advantage of remedying the defect by taking an average of three days—the day before and the day after on which the defect arose. A similar provision with regard to three days' average applied in the case of testing for illuminating power. This was already in the Bill ; it was not altered. They left this as it was with regard to illuminating power. This clause represented the result of negotiations which took place with the London County Council ; and at a meeting at which the matter was finally arranged between representatives of the Company and of the London County Council, this question of the three days' average was raised. At the meeting he did not think it would be disputed that no question was raised as to whether the three days' average might be resorted to, whatever the deficiency of calorific power might be ; and his clients, the representatives of the Company, came away from the meeting with the clear understanding that the County Council were prepared to assent to the proposition that, whatever the deficiency might be on any one day, the Company might resort to the three days' average. He was informed that the point was specifically raised.

Mr. FREEMAN : My instructions are that it was not raised.

Mr. BROWNE said that their impression was, when they left the meeting—he was not present at the interview—that the question of the amount of the deficiency would not arise. After the meeting, and when the draft clauses were submitted to the London County Council, they raised the point that if the deficiency were excessive beyond a certain specified quantity, the Company ought not to have the right to resort to the three days' average, and their ground for putting this proposition forward they would, of course, explain. But the point, as he understood it, raised by the County Council was that it would enable the Company to supply gas of extremely deficient calorific power on one day, and make good their defects by supplying gas of higher calorific power on the other two days. As against this aspect of the matter, they would represent to the Committee that if each day stood by itself, where the deficiency exceeded a specified quantity there would be no incentive to the Company to put right on the following day a defect which had occurred on a particular day. The amount of the deficiency was proposed to be 6 calories ; so that if on any one day the deficiency amounted to 7 calories, if that day was to stand by itself, and they were not to be entitled to average it on other days, there would be no incentive to the Company to supply higher calorific power in order to bring up the average to the even penalty amount, and they therefore suggested that the clause should be left as it was before the Committee now, and that there should be no limit put as to the amount of deficiency beyond which they might not be entitled to have the advantage, and to give the consumer the advantage of the three days' average.

Mr. FREEMAN desired to make the matter quite clear on a point which was rather a personal matter. He wished it to be understood that the three days was agreed between both the parties. The question of the limitation was not expressly raised in so many words; but the whole discussion was understood by his clients to be subject to the general provisions of the 1905 Act. He wished to state it so that it should not be supposed that he was in any way doubting the statement of the Chairman of the Company. The position was this : They desired that the same limitations, or the same limitations in principle, should be applied to calorific power as had already, after mature consideration, been applied to illuminating power in the Act of 1905. Their argument was this, that there would be a grave inconvenience to the commercial world of London unless some limitation in the variations of the calorific power was introduced, because it was much more likely to upset the workings of engines if suddenly variations in the calorific power took place, and there would be much stronger reasons for the varying calorific power than for varying illuminating power. The provisions of the Act of 1905 were contained in section 4, sub-section 3 : " If on any one day the gas supplied by the Company at any testing-place is of less illuminating power to an extent not exceeding 1 candle than it ought to be, the average of all the testings made at such testing-place on that day and on the preceding day and on the following day shall be deemed to represent the illuminating power of the gas on such one day at such testing-place." They saw there the words " to an extent not exceeding 1 candle." They substituted for these in this Bill : " To any extent not exceeding 6 calories." This was translating the illuminating standard as near as they could into calorific standard ; and when the Bill was argued on both sides before the Committee, the Chairman, in giving his decision, used these words : " The Committee propose to leave in sub-section 3 of clause 4 in the Bill ; but they think there should be a proviso that the deficiency of quality in any one day shall not exceed a certain limit—say, a candle. Obviously it would be inconvenient to customers that it should be entirely unlimited. It would not, of course, be the same thing if strong gas was supplied on one day to make up for very weak gas another day. We think there should be some steadiness in the supply." It was on the words " some steadiness in the supply " that they mainly relied as a justification for what they were asking now. In that case, the 1 candle was given. They were giving far more favourable terms than were given in the Act of 1905 ; and he asked the Committee, in the public interest, to support the principle that was laid down in the Act of 1905, and apply it to exactly similar things—namely, the calorific standard, which was now being introduced for the first time. He did not think he need say anything more.

After the Committee had consulted in private,

The CHAIRMAN said they were of opinion that the words ought to be inserted.

Mr. BROWNE said he was requested by the Gaslight Company to make a statement with regard to the standard of 125 calories which was fixed under the clause, and he would prefer, without any comment, to make it in the form which he had submitted to the representatives of the County Council.

The CHAIRMAN: When you speak of 125 calories, where does that come in?

Mr. BROWNE replied that it was a sort of theoretical standard; but not a standard below which any penalty arose.

Mr. CARLILE: That is a standard upon which the margin of 6 is calculated?

Mr. BROWNE: No; the standard of 125 is really, for practical purposes, in the clause ineffective so far as the clause goes.

Mr. CARLILE: The 6 is "below 112½?"

Mr. BROWNE replied in the affirmative. He went on to say that, under the decision of the Committee, they would not be entitled to take the three days' average if they went below 106½ calories.

Mr. CARLILE: That is equal to about 7 per cent.; and 7 per cent. is the margin already existing so far as illuminating power is concerned?

Mr. BROWNE said that was, in the view of the County Council, approximately the case—that about 6 calories represented about one candle.

Mr. FREEMAN: As near as we can get it.

Mr. BROWNE said the statement he had to make was in these terms: The Company agreed to the imposition of a test of calorific value reluctantly. They objected to the introduction of any test for calorific value, on the ground that such a new departure was one that should be effected by a General Act—say, by amending the Gas-Works Clauses Act—rather than by dealing with an individual company. They objected, further, to the standard fixed—viz., 125 calories per cubic foot—on the ground that such a value could not be obtained with any degree of certainty from 14-candle gas. They only accepted the standard on the condition that there should be a margin of 10 per cent. below the 125 calories before any penalties were imposed, and on the understanding that it was not to be expected of them that the standard would be regularly maintained.

Mr. FREEMAN asked that the West Ham clause should be brought up.

Mr. BROWNE said the other matter as to which Mr. Freeman was concerned was the clause that was inserted at the instance of the West Ham Corporation, with regard to the keeping open of the West Ham Gas-Works, which was as follows: "The Gaslight Company shall, for a period of ten years from the date of transfer, continue to use the gas-works of the West Ham Company, in the county borough of West Ham, to an extent substantially as great as that to which such gas-works shall have been used during the year immediately preceding such date." If the Chairman would refer to the words of his decision, he thought it would be found that this gave effect to his requirements; and he did not know that any point was raised upon it.

Mr. FREEMAN referred to the words: "The Committee find the preamble of the Bill proved; but they will require a clause to be inserted for the benefit of West Ham with regard to keeping open the present works for a period of ten years, on substantially the same scale as at present." He contended that the clause brought up failed in two respects. In the first place, it did not profess to be a clause for the protection of West Ham; and, in the second, and far more important, point, it started by saying: "To an extent substantially as great as that to which such gas-works shall have been used during the year immediately preceding such date." That was the date of transfer. This was not at all a satisfactory time, because it would be a period during which the gas-works might not have been kept up to anything like the extent they were when the Company were relying entirely upon themselves; and it was not the decision the Committee gave, because it was "at the present time." What he proposed was this: "For the protection of the Mayor, Aldermen, and Burgesses of the County Borough of West Ham, the following provisions shall have effect: The Gaslight Company shall not close the existing works of the West Ham Company situate within the borough for the period of ten years from the date of transfer; but during such period the said Company shall continue the manufacture of gas at such works and carry on the same as a manufacturing gas-works substantially on the same scale as they were carried on by the West Ham Company immediately prior to the introduction of the Bill for this Act." That was to say, that they should carry them on in the same way as they were carrying them on before the Gaslight Company appeared upon the scene and proposed to take over the works. He submitted that this carried out the decision of the Committee.

Mr. BROWNE stated that, with regard to the first point, prefacing it as a clause for the protection of the Corporation of West Ham, they had no objection whatsoever—in fact, he would have put the words in but that he understood West Ham were not present that day. With regard to the remainder of the clause, he submitted that his clause gave effect to the decision quite as fully as that of the West Ham Corporation. It was for them really to bring up a clause to give effect to the decision, though he did not wish to say that the West Ham Corporation were not entitled to submit an alternative one. The effect of the clause as proposed for the West Ham Corporation would be that the standard of the extent to which the gas-works should be used should be that immediately prior to the introduction of the Bill. This would be December last. At that time, of course, the working load of the gas would be at its very highest; and the effect of the clause would be that for ten years, summer and winter, they would have to keep the works open and manufacture, unnecessarily, of course, during the summer substantially for as great an amount of gas as was manufactured in the very darkest month in the winter.

Mr. FREEMAN: Then I will meet that point by putting in the word "year" before "immediately."

Mr. BROWNE asked what was objected to in his clause.

Mr. FREEMAN said they brought it at a period other than that which was the legitimate test—namely, the period when the works were taking it or selling the Gaslight Company the undertaking as a separate concern. They had now introduced the time when they knew that the works were coming in; and then there was not the same inducement to keep it up.

Mr. BROWNE: We have no choice with regard to the matter of the year. We will take it the year——

Mr. FREEMAN: Before the introduction of the Bill?

Mr. BROWNE agreed.

Mr. FREEMAN: That will satisfy me. We should have one year.

Mr. BROWNE said he would strike out the words "such date," and put in "before the introduction of this Act."

The CHAIRMAN: I think if you put the words "carried on by the West Ham Gas Company," and leave out the words "immediately prior," and insert the amendment of Mr. Freeman, the Committee would be disposed to give you that clause.

Mr. FREEMAN then read the clause as follows:

The Gaslight Company shall not close the existing works of the West Ham Company situate within the borough for the period of ten years from the date of transfer; but during such period the said Company shall continue the manufacture of gas at such works, and carry on the same as a manufacturing gas-works substantially on the same scale as they were carried on by the West Ham Company during the year prior to the introduction of the Bill for this Act.

The CHAIRMAN agreed.

Mr. BROWNE remarked, with regard to the expression "existing works," it had appeared before the Committee in evidence that the plant at present in the gas-works of the West Ham Company was not of a very satisfactory character; and if he agreed to the expression "existing works," it must not be understood that they were going to keep in the West Ham works precisely the plant that was there to-day. Subject to this, he had no objection to the clause.

The CHAIRMAN: I should not think West Ham would be anxious to keep the plant if it were not good.

The Ilford portion of the Bill was next considered.

Mr. BROWNE observed that, with regard to the opposition of the Ilford Gas Company, the decision of the Committee was that they would require an alteration in clause 3 as to the limits of supply. The point was that the definition in section 12 of the West Ham Gas Act of 1856 contained certain general words under which it was contended by the Ilford Company that they might claim to supply even within their area. The West Ham Company had not, in virtue of these general words, exercised any powers of supply except in one portion of Chigwell. It was thought at the time when they were before the Committee last that it was an insignificant area; but they now found that, by agreement with the Chigwell Gas Company, the area was not inconsiderable. Therefore they did not like to strike out the general words in reliance on which that supply was given with the consent of the Chigwell Company. So they proposed to delete altogether the definition of the West Ham district as in the Bill originally laid before them, and to substitute for it a schedule containing a specific description of the area of the West Ham Company. The words introducing the schedule would be: "The expression 'the West Ham district' means the several areas specified in the first schedule to this Act." If they looked at the West Ham Gas Act of 1856, he thought they would agree that the promoters had really given effect to the decision of the Committee in this way: "Definition of West Ham district. The several parishes, wards, districts, hamlets, and places following in the county of Essex—West Ham." He then brought up these words at the end of the clause: "West Ham (except so much thereof as is comprised within a segment of a circle of which the radius is a straight line 1000 yards in length measured from any point of the Essex extremity of the bridge known as the Iron Bridge over the River Lea in the Barking Road, Plaistow), Stratford-Langthorne, Plaistow, Upton, Forest Gate, Hudston Town, East Ham, Wanstead, Holloway, Down, Leytonstone, Little Ilford, Woodford, Snaresbrook, and (*a*) so much of the parish of Leyton as is not comprised within the limits of supply of the Lea Bridge District Gas Company, as defined by 'the Lea Bridge District Gas Act, 1878,' and (*b*) that portion of the parish of Chigwell in which the West Ham Company are at the passing of this Act supplying gas." With regard to the first—"(*a*) so much of the parish of Leyton"—it would be seen that in the area of West Ham, under section 12, that the parishes of Walthamstow and Leyton were included. It had been pointed out by the Lea Bridge Gas Company that the whole of the parish of Walthamstow, and part of the parish of Leyton, were within their statutory limits, and the West Ham Gas Company were debarred from supplying within those areas. They therefore altogether omitted Walthamstow from the schedule, and included in it only so much of Leyton as was not completely within the Lea Bridge District Gas Company's area. They also included the portion of the parish of Chigwell which the West Ham Company were supplying by virtue of the general words contained in section 12. So far as the Ilford Gas Company were concerned, he thought there could be no question but that their area was clearly excepted.

Mr. LEWIS COWARD, for the Ilford Gas Company, said he thought he could save any further trouble. That would carry out the decision of the Committee.

Mr. BROWNE stated, with respect to this amendment, that it was in substitution for an amendment which they had previously agreed with the Barking Gas Company, whose circumstances were practically identical with those of the Ilford Company. The representative of the Barking Company was there, and he had explained to him the amendment he proposed to make; but he was not able to put the amendment before him until that morning. Therefore it was agreed between them that if he wanted any drafting amendment to make his position more secure than it was, they should give it to him between now and the House of Lords stage. As to the last part of the Committee's decision, they had not been able to bring up an amendment, because they did not quite know what the further point was.

Mr. COWARD said the words "whether statutory or not" went out in clause 3; so that it would read: "The undertaking of the West Ham Company includes all rights of making, distributing, and supplying gas and all other the rights, powers, authorities, and privileges whatsoever of the West Ham Company."

Mr. BROWNE subsequently mentioned that the amendment arranged with the County Council was that the promoters should reduce their standard price from 3s. 3d., as proposed, to 3s. 2d. It was represented to them by the West Ham Company, whose undertaking they were purchasing, that this was a material alteration of the terms on which

they agreed to the amendment; and in order to meet their objections, they agreed that an amount additional to the £118 per £100 worth of stock that was to be paid to them should be paid, and that the additional sum should be £3 of Gaslight stock. But in order not in any way to injure or affect the consumer, the Gaslight and Coke Company agreed with the County Council that the amount of stock should be provided by the Gaslight Company purchasing in the open market, out of their reserve fund, the amount required. With regard to clause 34c, he explained that the point was raised by two local authorities on the south of the river—by the Wandsworth and the Lambeth Borough Councils. The position was that, under the scheme of 1883, referred to in this clause, a provision was inserted that in so much of the Gaslight Company's area as was south of the river, they should not charge for 16-candle gas any higher price than was charged by the South Metropolitan Gas Company for gas of the same illuminating power. The effect of this was that the price of gas south of the river was considerably less than it was on the north. When the South Metropolitan Company's illuminating power was reduced to 14 candles, the provision ceased to be operative, of course. Notwithstanding this, however, the Gaslight Company still continued to supply at a less price on the south side than on the north side of the river. Now they were reducing to the same illuminating power as the South Metropolitan Company; and it was represented to them that this provision should revive. They agreed to this; but the terms on which he agreed it with the other two authorities—Lambeth and Wandsworth—were not precisely these terms. He submitted the amendment to both the parties on the previous day; and he had heard from Wandsworth that they had no objection. He should, of course, have retained the amendment that he had undertaken to put in; but they were considerably pressed by the County Council to adopt this form of amendment in lieu of that which they had suggested. Inasmuch as the County Council's only object was identical with that of the Lambeth Borough Council, he could not conceive that they would raise any objection to the substitution of the amendment; but having undertaken with them to insert it in another form, he had felt obliged to save himself in the matter.

The clauses of the Bill were read, and agreed to, with amendments. The preamble was then passed; and the Bill was ordered to be reported, as amended, to the House.

## HECKMONDWIKE AND LIVERSEDGE GAS BILL.

### House of Lords Committee.—Tuesday, March 23.

(*Before the Earl of* KINTORE, *Chairman*, *Viscount* IVEAGH, *the Earl of* LOVELACE, *Lord* POLTIMORE, *and Lord* TEMPLEMORE.)

To-day their Lordships commenced the consideration of the Heckmondwike and Liversedge Gas Bill, which is to enable the Heckmondwike Gas Company to extend their works, convert and consolidate their capital, and for other purposes.

Mr. HONORATUS LLOYD, K.C., and Mr. CLEASE appeared for the promoters; Mr. BALFOUR BROWNE, K.C., and Mr. C. C. HUTCHINSON represented the Heckmondwike and Liversedge Urban District Councils, the only petitioners against the Bill.

Mr. HONORATUS LLOYD, in opening the case, said the objects of the Bill were to enable the Heckmondwike Gas Company to add to their works, raise additional capital, purchase by agreement the mains of another Company within a portion of the district where hitherto there had been competitive powers, close and divert two footpaths, consolidate and convert the different classes of capital, replace the present maximum price arrangement by a sliding-scale (the standard price being 3s. 3d. and the dividend 5 per cent.), apply the modern testing provisions, change the name of the Company, and generate and supply power gas. The old Heckmondwike Gas Company had existed since 1843, and it was made a statutory undertaking in 1862. The maximum price was 4s. 6d. per 1000 cubic feet; but the actual price now was 3s. 4d., less a discount which reduced it to 2s. 6d. to private consumers—the charge for public lighting being 2s. 4d. The Company had been supplying at too low a price, and therefore had had to draw upon their reserve fund the last few years in order to pay maximum dividends. The capital amounted to £63,000, bearing maximum interest varying from 4 to 10 per cent. The capital powers, together with borrowing powers as to £13,500 more, had practically all been exercised. The demand for gas had very largely increased of recent years, and was still growing. The quantity supplied had, on some days, exceeded the storage capacity; and in case of fogs, to which the district was subject, the Company had been put to dire straits. On some occasions, in fact, the supply had run short. With regard to power gas, the Company desired to be in a position to supply it, the district being an industrial one; though Counsel said he did not know that at the moment there was any special demand for it. The two Councils suggested in their petition that the Committee should convert the Bill into one for purchase, and complained that they had not had sufficient time to enable them to promote such a Bill themselves. They said a gas undertaking should be in the hands of the local authority, and that they should be allowed to purchase, or, at any rate, that the powers of the Bill should be suspended. They alleged that there had been considerable waste in the manufacture and distribution of gas within the Company's limits of supply. In 1901, when they unsuccessfully promoted a Bill for the compulsory acquisition of the undertaking, they made a similar allegation; and there was some truth in the allegation—the district being a colliery one. But since then the leakage had been seriously dealt with, and the proportion of unaccounted-for gas compared very favourably with that of any other similar district. The Councils asserted that the Company had spent money out of revenue for many purposes to which capital was properly applicable. No doubt this was so in the early days; but that was all gone into in connection with one of the Company's Acts of Parliament. It was also said that, without statutory authority, they had placed large sums to a depreciation fund. Though he represented the Company, he did not know what this meant. There was nothing in the complaints; on the contrary, the Company's undertaking was admirably managed. When the suggestion of purchase was made, he was rather provoked to contrast the Company with the Local Authority. The Heckmondwike District Council had recently been the subject of inquiry by a Local Government Board Inspector; and a more condemnatory report than that which was issued last September he (Counsel) had never read. The Inspector reported that the rates had increased from 6s. to 7s. 8d. in the pound between 1898 and 1907; that in most respects "sanitary administration in Heckmondwike is almost in abeyance;" and that he was "not able to obtain any satisfactory explanation of the Council's omissions in this respect, beyond the statement that the financial conditions of the district rendered it inexpedient to spend more money on paving streets at present." Here was an authority who said they were not in a financial position to pave their streets, and yet asked to be put in a position to spend the ratepayers' money on the purchase of a gas undertaking. The report concluded: "It is clear that the Heckmondwike Urban District Council have in many directions grossly neglected their duties as a sanitary authority, and that, notwithstanding their ineffective administration, they have not succeeded in keeping down the rates." The Council had embarked on an electrical undertaking; and though they had been authorized to spend only £20,000, they had laid out £40,000 on it. This was the authority who had the impertinence to suggest that the Gas Company could not carry on their undertaking, and that they (the Council) could do it better. They asked for a provision enacting that there should be no enhancement of the value of the undertaking as a consequence of the Bill being passed. That was to say, they wanted some little encouragement to come again next year to Parliament.

Evidence was then given in support of the Bill.

Mr. *F. D. Richmond*, examined by Mr. CLEASE, said he was appointed Manager and Engineer of the Company in August, 1904; and in January last year he became Secretary. The area comprised the two urban districts of Heckmondwike and Liversedge; but part of the latter place was supplied, by arrangement, by the Cleckheaton Urban District Council. The Company would have had to go into Cleckheaton parish to get to this portion of their area; and to avoid doing this, they arranged with the Council to supply about 1700 houses there. The Company also supplied by request, but without statutory powers, the village of Hartshead, in the rural district of Halifax. The plant of the Company comprised six beds of inclined retorts capable of producing 700,000 cubic feet of gas per day, which was the maximum consumption of the Company; one set of condensers, which had been in use for some fifty years, and would require enlargement in the near future; exhausters which would be equal to the demand for the next few years; scrubbing and washing plant which would allow for an increase of 25 per cent. in the make of gas; purifying plant which was only just equal to dealing with the present make of gas; and a meter and governor large enough for the next few years. The storage was absolutely insufficient; and one of the main objects of the Bill was to provide an adequate gasholder. The valve-house and holder connections would have to be remodelled when the new gasholder was erected. There was an old retort-house fitted with ten beds of direct-fired retorts, which were obsolete, and of very little use. There were two holders; the capacity of one being 350,000 cubic feet and of the other 100,000 cubic feet. The latter was of very little value, and could not be used at all at night. In the Company's area fog often lasted two or three days, so that the storage capacity must be ample. On such occasions, they experienced the greatest trouble in meeting the demand for gas. Besides the difficulty of maintaining a proper supply, there was considerable waste in keeping the retorts always ready to go into action. They proposed to erect a holder with a capacity of a million cubic feet. The consumption of gas had steadily increased for many years. It had risen from 79 million cubic feet in 1896 to 103 millions last year. The increase was accounted for by the consumers being given facilities to utilize gas, and being allowed to obtain appliances from the Company on very reasonable terms. Since he had been Manager, he had done a good deal to develop the use of penny-in-the-slot meters, as well as apparatus for heating and cooking in working-class houses. The total number of consumers in the district on Dec. 31 last was 5991. The quantity of gas now being consumed through prepayment meters was 13,400,000 cubic feet. Of the total gas sold, 24 per cent. was for trade purposes, and 4½ per cent. for public lighting. The population of Heckmondwike was estimated at 10,000, and of Liversedge 15,000. There were about 6400 houses, including shops, mills, and workshops, in the two areas; and on Dec. 31 last 5991 meters were in use. The ecclesiastical parish of All Saints, Roberttown, in Liversedge, was supplied by the Mirfield Gas Company jointly with the promoters; the Mirfield Company having 230 customers in this area. Terms had been arranged for the acquisition by the promoters of the rights of the Mirfield Company in the area. Customers were supplied with service-pipes up to 20 yards, and in some cases of greater length, free. The standard illuminating power of the Company's gas was 14 candles; and they had supplied gas of from 15 to 15½ candle power. The maximum price under the Act of 1875 was 4s. 6d. per 1000 cubic feet; but since 1895 they had been selling at 2s. 6d. for lighting, heating, and cooking—the figure for gas consumed through prepayment meters being 3s. 4d. The Company's price compared very favourably with that of other gas companies in the district. The leakage amounted to 8·6 per cent., which also compared well with that of any other district similarly situated. The mains ran, to a very large extent, over coal measures, which sometimes meant a fracture, and consequent leakage. The District Council's last complaint was in the winter of 1904; and it related to the supply and quality of the gas. It arose out of trouble with the stokers. It was put right, and they had never complained since. The supply of gas was adequate throughout the district, except in times of fog, when the demand was as much as the Company could cope with. They did not receive complaints generally, and those which came to hand were not of a serious character. Not quite sufficient money had been spent on repairs and renewals of plant in the past. The Company obtained 9497 cubic feet of gas per ton of coal carbonized in 1901, and 10,724 cubic feet in 1908, which was an extremely good yield. The percentage of gas unaccounted for on the make was 9·57 in 1901; it rose to 19·5 in 1904, under the late Manager; and had since steadily declined to 8·6 in 1908. Authority was sought to raise £60,000 by shares and £27,500

by borrowing. The Mirfield Company were to be paid £2407. A sum of £1196 from the reserve fund had been put into the works, and it was proposed to replace it. When the Company had met these and other items, the balance for future requirements would be £68,000, which would last about fifteen years. The capital raised at Dec. 31 last was £72,588, which worked out at £703 per million cubic feet of gas sold. This figure would probably be greater in future, owing to the development of the prepayment meter system. The increase in consumption was estimated at 83 millions, which at £750 per million came to £62,250; so that the Company would have about £7000 for working capital. They had been selling gas for some years at 2s. 6d. per 1000 cubic feet; but this had not yielded quite sufficient profit to enable them to pay maximum dividends. There was every reason to believe that the cost of coal would increase by 1s. 6d. to 2s. per ton, having regard to the fact that there was a thin seam in the district, and that the Coal Mines Regulation Act would soon be in operation. In addition, wages and other expenses were increasing in the district. In these circumstances, the Company asked for a standard price of 9d. in excess of the present charge.

In cross-examination by Mr. HUTCHINSON, witness said the standard price of 3s. 3d. for which the Company were asking would at present leave them a margin of 9d.; and taking it on the basis of the old capital, it would, he believed, give them an increase in dividend of 2½ per cent. all round. He could not deny that for the last 45 or 47 years there was not a year in which the Company had not paid maximum dividend.

Mr. HUTCHINSON: So that the effect of your proposed sliding-scale would be not to go on paying, as you have been paying, 10, 7½, and 7 per cent. for 45 years, but 12½, 9¾, and 9¼ per cent.?

*Witness:* Yes; if it could be done.

In further cross-examination, witness said if the undertaking were purchased, the shareholders would be compensated on the basis that for 45 years they had been getting maximum dividends, and they would get top price. The shareholders would receive an amount of capital which would provide them with the same income that they had been receiving. Asked what injustice would be done to them by the purchase of the undertaking, witness said they had a secure investment now, and they would have to seek a fresh one. He did not know that it was the common practice of arbitrators to provide for the cost of reinvestment. He did not think the Local Authorities could manage the undertaking. He thought places were much better off, from the consumers' point of view, with gas undertakings in the hands of companies than in those of local authorities. Possibly they could borrow money more cheaply; but the profit they made went to pay off the cost of the works. They very seldom lowered the price of gas. He did not say that £1084 debited to the revenue account in respect of payments for stoves, prepayment meters, cookers, &c., in 1907 and 1908 should have gone in reduction of the price of gas. Stoves and fittings had a very short life, when once they had been fixed. The capital value deteriorated at once. He was aware that in the past history of the Company considerable sums were debited against the revenue account which should have been expended out of capital; and he accepted as correct the amount of £14,000 which appeared in the capital account. There were 1090 slot-meters in use in the Company's district; the total number of supplies being about 6000. During the last five years he had reduced the leakage and the waste in the coal carbonized; the benefit to the consumer being a better supply of gas than formerly. Questioned as to whether the consumer obtained the better supply at less price, witness said they could not give the consumer much benefit when they were supplying him at so low a figure as they were doing. There must be a limit somewhere. The cost of production per 1000 cubic feet of gas in 1904 was 23·7d.; in 1905, 23·9d.; in 1906, 3d. less; in 1907, 17d.; and in 1908, 18·63d. These figures were not abnormally high. Asked to point to a place in the immediate neighbourhood, furnishing a supply of gas under similar circumstances in comparable amounts, where the total cost of production, manufacture, maintenance, and distribution, including all charges, was nearly as high as that of the Heckmondwike Company, witness named Cleckheaton and Longwood. The reserve fund of the Company was not quite full.

Re-examined by Mr. CLEASE: There was a considerable difference between the proposed standard price and that at which gas was actually sold. He had never known a gas company increase their price to the amount of the standard, when one was granted. If they were to do so, they would lose trade. The Heckmondwike Company were very strong in their desire to retain possession of the undertaking. The dividends they paid were certain; but there would be great uncertainty as to the amount which an arbitrator would award if they had to sell their undertaking compulsorily. The premiums obtained when shares of the Company were sold were such that the yield to the purchaser was only 4 per cent. If the Local Authorities did not make a larger profit out of the concern than the Heckmondwike District Council made out of their electric light undertaking, the rates would not benefit. With regard to the purchase of stoves, cookers, fittings, pipes, and so forth out of revenue, as soon as ordinary fittings were put into a house their capital value was gone. The life of ordinary cookers, and things of this sort, was about five years; and it was the universal practice to pay for them at once, either out of revenue or out of a suspense account formed from revenue, in order that they might not have as capital in their books that which at the end of five years was not capital. As to the £14,000 referred to by Mr. Hutchinson, the Company paid dividends on the amount of capital authorized by Parliament, not that amount *plus* the £14,000. Though, as a result of better management in the past few years, the consumers had not had a reduction in price, there had been no increase, though the cost of coal and labour had risen. There had, however, been a reduction in the price of gas for power purposes.

Mr. *J. J. Stead*, the Chairman of the Company, stated that the plant and works generally were in good condition. No trouble was experienced in getting purchasers for the shares. It had been suggested that some members of the two Local Authorities did not, as shareholders in the Company, receive an intimation of the promotion of the Bill; but, as a fact, witness, at the last annual meeting held in August, announced that the Bill would be brought forward. He did not think the opposition of the Heckmondwike District Council was approved of in the district; nor did he consider any advantage would accrue if the proposed transfer took place. For years neither of the two opposing Councils had complained with regard to anything connected with the Company; and therefore there were no grounds which would justify the compulsory transfer of the undertaking. The Company were doing all they could to push the supply of gas, and to comply with the requirements of the district.

In cross-examination by Mr. HUTCHINSON, witness said the Company now just about paid their way.

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### Wednesday, March 24.

On the resumption of the proceedings to-day, several witnesses expressed their disapproval of the proposed compulsory transfer of the Company's undertaking, and spoke to their satisfaction with the existing supply.

Mr. *E. H. Stevenson* was then called. In reply to Mr. CLEASE, he said the condition of a great portion of the Company's works was good, but that there were parts which showed that in the past sufficient money had not been spent on maintenance and repair. These parts, however, would soon have to be enlarged, in consequence of the growth of the undertaking. The leakage, though at the high figure in 1901 of 19½ per cent., was now only 8·6 per cent., which was very satisfactory, having regard to the fact that this was a colliery district. The gasholder capacity was very much below what it ought to be. In time of fog, the gas consumption (this being a manufacturing area) increased very rapidly; and proper pressure could not be maintained unless there was a very large excess of storage capacity. He had often advised gas companies and local authorities in similar districts to have storage at least equal to 150 per cent. of their maximum daily output. The price charged by the promoters compared very favourably with that paid by consumers in places of approximately the same size in the West Riding of York. He approved of the proposed purchase of the Mirfield Company's mains, as it was a mistake to have two gas companies in the same area. The conversion of the Company's shares was a purely domestic matter which would not affect the amount to be paid in the shape of dividends. The additional capital asked for was necessary. The rate of increase in the business had been very satisfactory, and until the latter part of last year it had been maintained. Bad trade towards the close of 1908 affected the Company as it did others in manufacturing districts. Assuming the rate of increase to be 4 per cent. per annum, the proposed amount of new capital would be just about sufficient for the next fifteen years. In connection with the fixing of the standard price at 3s. 3d., whereas the Company were actually charging 2s. 6d., it was to be remembered that they had been living on past balances and the reserve fund. In the years 1901 to 1906, there was a net deficiency of £5390 on their dividends, which represented 1½d. per 1000 cubic feet of gas sold; and during most of these years sufficient money was not expended on maintenance and repairs. In consequence of the seam of coal in the district being thin, and of the operation of the Miners' Eight Hours Act, an increase in the cost of coal would almost certainly occur. In the adjoining district, there was a similar margin—viz., 9d.—to that proposed in the Company's area. A standard price might be higher or lower than the price actually charged; and in this case it should be higher.

Mr. CLEASE: Do you consider authority should be given to these Local Authorities to purchase?

*Witness:* No; I am perfectly certain they cannot manage better, and probably they cannot manage as well. They have not shown that they are capable of managing the things which Parliament has already given over to them.

Bearing in mind the fact that Parliament refused to allow them to purchase in 1901, and that the complaints alleged then have since been remedied, you think there is no reason for the transfer?—That is so. There is no change except in the betterment of the Company and in the gas supplied to the consumers.

In further examination, witness said it was quite proper to pay for the cookers, &c., out of revenue year by year.

Cross-examined by Mr. BALFOUR BROWNE, witness said that since 1901 there had been certain years in which the Company had not earned enough to pay full dividends. The deficiency was due partly to payment out of revenue of the cost of replacing a retort-house by another, which was maintenance of works, and partly to the payment from the same source of the cost of slot-meters and stoves. The Company acted quite legally in defraying the cost of these things in this way. Questioned as to whether, assuming that the money should have been taken from capital, there would have been no deficiency, and that the Company would have been able to pay full dividends out of revenue, witness answered that anything could be proved by an assumption. The cost of replacing things swept away must be borne by revenue. It was usual to apply for authority with regard to the supply of power gas.

Mr. BALFOUR BROWNE: In this case, there is no condition put in with regard to the quality, composition, or price of the gas?

*Witness:* There are clauses which cover all that.

Will you give me a case in which powers have been granted to a company to supply power gas without restriction as to quality, composition, or price?—Yes, the Matlock Bath case.

In that case, all those things were stipulated for?—I had forgotten that. It may be so.

Does the laying of pipes for power gas involve a very large trench; the pipes being much larger than those required for ordinary gas?—No; because power gas is generally supplied under pressure.

If your maximum dividend is paid by your present revenue, you will, if you have this margin of 9d., be able to divide extra dividends. How much, in addition to the nominal 5 per cent. over all your capital, would that 9d. enable you to divide?—Nothing, unless we can earn it; and we cannot earn it with our present price of gas.

If you do earn it, how much will it increase the 5 per cent?—By nine half-crowns, or £1 2s. 6d. per cent.

All that must come out of the pockets of the consumers if you earn it?—Yes; but we cannot earn it.

In further examination, witness said the Company were at the end of

their tether so far as their present capital was concerned. It was not usual in such circumstances for Parliament, whether or not there was complaint of the Company, to sanction a transfer of the undertaking.

Re-examined: He had never known a Committee of Parliament authorize the transfer of a gas undertaking to a local authority who, like the Heckmondwike Council, had absolutely failed in carrying out their sanitary duties.

This concluded the case for the Bill. No evidence was called for the petitioners.

Mr. BALFOUR BROWNE then addressed the Committee on behalf of the Heckmondwike and Liversedge Urban District Councils. He maintained that the prepayment meters and stoves, &c., should have been paid for out of capital; and therefore the pretence of the Company that they could not pay dividends without drawing on their reserves had really no foundation. The Company had been well able to pay their dividends; and, if the Committee passed the Bill as it stood, they would be able to pay much larger ones. It was always an ungracious thing for a local authority who sought to purchase to try to cripple the undertaking it had in view. If the purchase was sanctioned, all their incapacities, all their illegal acts would have to be considered at the arbitration; and that would be the time to see whether they had or had not done their duty. He did not propose therefore to go into questions of past management. At the same time, it was ungracious and improper of Mr. Lloyd to make an attack, which had absolutely nothing to do with the present inquiry, on the Heckmondwike Council. The Committee could not inquire into the sanitary affairs of the Heckmondwike Council. If these were not satisfactory, they must be dealt with by the Local Government Board. The question was not whether Heckmondwike had done its duty as a sanitary authority, but whether, if the Committee allowed the Bill to proceed, they would give the Local Authority an opportunity of promoting a Bill for the purchase of the undertaking. If a local authority and a company were applying for the first time for power to supply in the local authority's district, there was no doubt that the company would not be allowed to have a footing, and that the local authority would. The Heckmondwike Company were practically no longer a statutory Company supplying gas. They were asking to be a new Company on the back of the old one. The Company were, by confession, at the end of their tether; they could not go on any longer. This being so, the right of the petitioners, as the Local Authority, to supply themselves absolutely arose, unless the Committee passed the Bill. In 1901, the Local Authorities promoted a Bill to purchase the undertaking of the Company. Mr. Baggallay, on behalf of the Company on that occasion, resisted the proposal on the ground that they had a prospective value, inasmuch as they had still £31,000 to spend; and he added that if they were at the end of their tether, the matter would be entirely different. Mr. Baggallay went on to mention rules which appeared to govern Parliament in taking action in cases of proposed transfer, and remarked that if the concession had run out, if the Company had spent all the capital Parliament had allowed them, and if they then applied again to Parliament, the Local Authority might ask for transfer. This was the case here. No injustice would be done. Future capital would have to be sold by auction; and it would be bought by the public. The existing shareholders would receive the full value of their shares. If the Company were at the end of their tether, what harm would be done by the transfer? In a great number of cases, local authorities were supplying more cheaply than companies. He did not ask the Committee to throw out the Bill. This might be an injustice to the Company. He did, however, ask them to suspend the measure, as had been done in a great number of other cases, in order to give the Local Authorities an opportunity of promoting a transfer Bill. If this were done, and the ratepayers refused to allow the Local Authorities to promote such a measure, the Company would still have their Bill in the form in which they wanted it. If the Bill were promoted and Parliament said the Local Authorities were not such that the gas undertaking should be transferred to them, then, again, the Company would still have their Bill. The Company stole a march on the Local Authorities. They never heard of the Bill until the formal notice was issued; it being then too late for the Councils to promote a Bill in the present session. But for this fact, there would be another Bill before Parliament. Mr. Lloyd, merely for prejudice sake, brought in a report, and mentioned certain things, against the Heckmondwike Council which were absolutely irrelevant. The Batley Council, against whom there was an equally bad report, had their own gas-works. Was it fair that the Company should, by this Bill, take away the chance of the Local Authorities? The Bill would enhance the value of the concern to an enormous extent, because it would establish the sliding-scale arrangement with a standard price, giving them a margin of 9d. Surely this would not be fair to the people of the district. He would not criticize the clauses of the Bill as he might do. He proposed that the Committee should pass the Bill, but leave his clients for another year in exactly the same position as that in which they were to-day.

The CHAIRMAN, after a brief consultation with his colleagues: We all agree that Mr. Balfour Browne should have his suspensory clause; and we pass the Bill.

Mr. CLEASE asked the Committee to adopt the Merthyr Tydfil form of suspensory clause, with a provision that the Company should be empowered to expend money on the erection of the gasholder.

Mr. BALFOUR BROWNE said his instructions were that it was not necessary to provide the proposed gasholder in the next year, and that, even if it was necessary, the one proposed was far too large. If the Company were going to spend anything on capital account in the year, it should only be with the consent of the Local Authorities. These Authorities would not object to anything reasonably necessary to increase the supply.

Mr. CLEASE said there was no evidence that the Local Authorities would promote a Bill next year.

Mr. BALFOUR BROWNE: My instructions are that this gasholder is entirely unnecessary.

Mr. CLEASE: You have given no evidence on the point. We have; and I think we have shown it is necessary.

Mr. BALFOUR BROWNE: We are willing to have an arbitration as to whether it is necessary; and if the arbitrator says it is, we will give our consent.

Mr. CLEASE: In the Merthyr case, they recognized that a gasholder was necessary, and gave the Company power to spend money on it.

The CHAIRMAN: I think that is fair.

The clause was accordingly altered; and the other clauses having been adjusted, the Bill passed the Committee.

## MUSSELBURGH GAS ORDER.

On Friday, a Parliamentary Commission, consisting of Sir Henry Craik, K.C.B. (Chairman), the Earl of Glasgow, Lord Saye and Sele, and Mr. Dundas White, sitting in Edinburgh, considered the application of the Musselburgh Gas Company for a Provisional Order.

The Company was formed in 1831, and carried on business as the Musselburgh and Portobello Gaslight Company till 1884, and thereafter as the Musselburgh Gaslight Company. In 1837, the Musselburgh Gas Order was obtained, which conferred statutory powers. The authorized capital was £20,000, with power to borrow to the extent of £15,000. All the capital has been issued, and the borrowing powers have been exhausted. The demand for gas has increased, and is still increasing. By the present Order the Company is dissolved and reincorporated under the name of the Musselburgh Gas Company. The capital is fixed at £55,000, in shares of £1, fully paid-up, of which £30,000 is regarded as original, and £25,000 as additional capital; and £4000 of preference stock, in shares of £10 each. The dividend upon both classes is fixed at 5 per cent. Borrowing powers are conferred, not to exceed, including the £5000 borrowed by the old Company, one-third of the capital. Power is given to create reserve and special purposes funds; the annual contribution to the latter of which is not to exceed 1 per cent. of the paid-up capital, and the fund not to exceed one-tenth of the capital. The price of gas is fixed on a sliding-scale; 3s. 9d. being the standard, and the variations being 2s. 6d. on the dividend for every penny on the price of gas, up or down. Differential charges are allowed for gas consumed for other purposes than lighting. Discounts are allowed, not to exceed 10 per cent. to ordinary consumers, for prompt payment, and 15 per cent. to large consumers. For the hire of prepayment meters and fittings, the maximum charge is to be 10d. per 1000 cubic feet. The minimum illuminating power is fixed at 14 candles, to be tested in the Company's station, by a "Metropolitan" argand No. 2 burner. The pressure is to be not less than 8-10ths. There is a saving clause as to penalties for insufficiency of pressure, defect of illuminating power, or excess of impurity of the gas, where it can be shown as being produced by circumstances beyond the control of the Company. The Company have power to specify the sizes of material and pipes and fittings to be used in the first instance or on the occasion of any renewal between the mains and the meters. Power is asked to require every meter to be placed as near as reasonably practicable to the gas-main, but within the outside wall of the boundary to the consumer's property.

Mr. Macmillan (instructed by Mr. Beveridge, the Parliamentary Agent) appeared for the Company; and the Hon. W. Watson (instructed by Messrs. Guild and Guild, W.S., of Edinburgh) represented the Musselburgh and District Electric Light and Traction Company, Limited, who were the only opposers, and whose opposition was as to the position of the mains.

Mr. Macmillan intimated that the question with the objectors had been arranged. Mr. James Gibson, the Chairman of the Company, said he was familiar with the statements contained in the preamble of the Order; and the statements were true.

The Commissioners found the preamble proved, and clauses were adjusted.

Mr. Beveridge stated, with reference to the clause regulating the position of the meter, that it was not the Model Clause. The question had been discussed with Mr. Herring, of Edinburgh, who attached considerable importance to the position of the meter.

The Commissioners were of opinion that the Board of Trade clause should be imported into the measure, and suggested that if the Company wanted an alteration in it, they should apply to the Board of Trade.

## SWINTON AND MEXBOROUGH GAS BILL.

The Unopposed Bills Committee of the House of Commons presided over by Mr. EMMOTT (Chairman of Ways and Means) had before them on Thursday the above Bill.

Mr. LEES (Parliamentary Agent for the Bill) said the Bill was one to constitute a Gas Board, consisting of representatives of the Urban District Councils of Swinton and Mexborough in the West Riding of York, for the purpose of purchasing the undertaking of the Swinton and Mexborough Gas Company. The Company were constituted a statutory undertaking by the Swinton and Mexborough Gas Act of last year; a clause being inserted in the measure giving the two Urban District Councils the right to purchase. The whole of the report of the Local Government Board had been met; the only possible question outstanding being the period for the repayment of the loan.

The CHAIRMAN inquired whether the following paragraph in the Local Government Board report had been met:—

> The proposal that the mortgage debt of the Company should remain a charge on the undertaking after its transfer to the Gas Board is in accordance with section 81 of the Act of 1908; but the Board may state that it is, in their opinion, undesirable in ordinary circumstances to transfer to local authorities the mortgage or other debts charged on undertakings transferred to them. The Board suggest, therefore, that if the mortgage debt can be redeemed, the transfer should be made free from all debts of the Company, and that the purchase money to be paid to the Company should be fixed at such an amount as will provide the funds needed to enable the Company to extinguish the mortgage debt charged on the undertaking.

Mr. LEES said the suggestion was that, if possible, the Company should pay off their mortgage debt, and that it should not be transferred to the Board. If this course were adopted, it would be in direct

opposition to a decision of Parliament last year. He had no power to force such a provision on the Company, nor would such a provision be in accordance with precedent. He knew of no case in which a statutory gas company purchased by compulsion had been compelled to pay off their mortgage debt. From the Local Authority's point of view, it was quite immaterial whether or not they took over the debt.

Mr. MOON, K.C. (Speaker's Counsel): You are buying subject to all their mortgages and liabilities?

Mr. LEES: Yes; and that is according to precedent in taking over a statutory company.

The CHAIRMAN: I think that sufficient. Now as to the period.

Mr. LEES said the period originally asked for was forty years; but it was now 35 years. In their report, the Local Government Board gave all the periods which had been allowed in recent Acts for the purchase of gas undertakings; and he submitted that, having regard to these, the period suggested in this case was well justified. He could not offer any evidence as to the state of the works of the Company—permission to inspect them having been refused.

The CHAIRMAN: You are buying a pig in a poke?

Mr. LEES: In the sense that we do not know what we are purchasing. But we are going to buy by arbitration; and when we have served notice to treat, we shall be entitled to inspection of the works and of the books of account.

Mr. MOON: The price you pay is not based on what the works are—on the value of the pipes or what has been spent on them—but on the goodwill which you buy. The money you pay will be ascertained in reference to the value of the goodwill; and that you hope will last for more than 35 years.

Mr. LEES said for all time, until something came along which was better than gas. He said the question of period was very important to the promoting Councils. These Councils went into this business having regard to what happened in the Pontefract and Wath and Bolton cases—the period in both being 40 years, and the areas being adjacent to Swinton and Mexborough. Moreover, in the Pontefract case, the period was allowed by the Police and Sanitary Committee—a body who were very stringent in regard to this particular matter.

The CHAIRMAN: We have decided to allow you the period of 35 years; but I think I ought to say that the mind of the Committee is set against any increase, and, in fact, is rather set on a decrease, in the number of years they are likely to allow for the purchase of gas-works, because of the somewhat doubtful character of the undertaking in the future. I make this as a general statement for the assistance of anybody whom it may concern.

Mr. *J. W. Hattersley*, the Clerk to the Mexborough Urban District Council, gave formal proof of the preamble; and the Bill was allowed to proceed.

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**Price of Gas at Bradford.**—A meeting of the Finance Committee of the Bradford City Council was held last Thursday, when the business to be submitted to the next meeting of the Council was considered. A resolution was proposed by Mr. Trotter, and was strongly supported by Alderman Land, recommending the Gas Committee to raise the price of gas. No amount was stipulated in the resolution; but an increase in the price of 2d. per 1000 cubic feet was generally spoken of. The resolution was passed with few dissentients. A proposal was also submitted by the Gas Committee asking the Finance Committee to give back to them the balance of the £2000 appropriated last year for the clearing of insanitary areas; the Health Committee having spent only about £120. This resolution was strongly supported; but finally the Chairman (Mr. David Wade) persuaded the Committee to leave the matter over, as there was no immediate hurry.

**Londonderry Gas Company.**—At the ordinary general meeting of this Company on the 26th ult., the accounts presented showed a profit balance of £4281; and the Directors recommended dividends of 10 and 7 per cent. per annum, less income-tax. The Chairman (Mr. H. J. Cooke), in moving the adoption of the report, said the Company had been working at considerable disadvantage during the past year, especially in regard to the price of coals and other materials, the extra charge for which was a very considerable item in the expenditure. However, owing to the recent improvements at the works, they had come through the year fairly well, notwithstanding that they had spent a large sum upon the renewal of several parts of the plant. The Directors intended to pursue the course of getting the works into the highest possible state of efficiency for the more economical production of gas, which they deemed to be the best policy in the interest of consumers and shareholders alike. The report was adopted.

**Cromer Gas Company.**—At the recent ordinary general meeting of this Company, Mr. Percy Griffith, who was formerly the Company's Consulting Engineer, but is now upon the directorate, in seconding the motion for the adoption of the report, dealt *seriatim* with the paragraphs which he thought the shareholders might desire to have elucidated. He pointed out that the Directors had taken a step by which the capital would be written down by £6492, which would aid them in strengthening the security of the shareholders' property. With regard to the extension of the undertaking to East Runton, he said it was not anticipated that there would be much development there, but it was at West Runton where they would have the greatest amount of scope. He mentioned that the Company had obtained the public lighting in Cromer for the next twelve months; and in this connection he referred to the good relations existing between them and the District Council. Commenting on the 2 per cent. dividend recommended, he said he thought it well to maintain a steady dividend, which was much more satisfactory than a variable one, and would improve the Company's position on the market. Mr. C. J. Parker criticized the action of the Directors in regard to many of the matters mentioned in the report; and he moved, as an amendment, that no dividend be paid. On a show of hands, the numbers were equal; but on a vote being taken according to holding, the amendment was lost by 82 votes to 47. The report was adopted with the exception of a clause relative to a money payment to Mr. Griffith, which the Directors thought should be made in recognition of his valuable services to the Company.

# LEGAL INTELLIGENCE.

## CARRIAGE OF COAL TO THE BIRMINGHAM GAS-WORKS.

The inquiry by the Railway and Canal Commissioners into the allegation by the Corporation of Birmingham of excessive charges by the Midland, London and North-Western, and Great Western Railway Companies for the carriage of coal to and from their gas-works at Saltley, Nechells, Windsor Street, and Swan Village, the opening proceedings in which were reported in the "JOURNAL" last week (p. 922), was continued on the 29th ult.

Mr. T. Mitchell Hill, the Mineral Traffic Manager of the London and North-Western Railway Company, examined by Mr. Simon, said it was impossible to take the outward traffic from Nechells straight to its destination, because it was not received in train loads for any particular place, but had to be all rearranged on the Company's sidings at Windsor Street. It could not be done nearer to Nechells because of the amount of traffic on the lines. If the Corporation provided sufficient sidings for marshalling the trains within the works, he would have no objection to doing it there. He doubted whether the Corporation could find ground for the extension of sidings; and even if they did, there would be the objection to them that there was a falling gradient towards the gas-works. The Company had the same difficulty in dealing with outward traffic from the Windsor Street works as from the Nechells works. If the plaintiffs were to marshal all their trains on their own sidings, he would gladly give up the 1d. a ton now charged.

In cross-examination by Mr. Balfour Browne, witness admitted that the coke from the Corporation works was shunted and marshalled with other traffic at Windsor Street.

Asked if a railway company could conduct its business without sidings for shunting and marshalling goods, witness replied that, speaking generally, traffic must be shunted and marshalled, and the Railway Companies must have a place for it. Theirs was at Windsor Street; but if other arrangements were made, they need not take the Corporation coke there.

Mr. A. Jephson, the Assistant Goods Manager to the London and North-Western Railway Company, and Mr. T. H. Rendell, the Chief Goods Traffic Manager to the Great Western Railway Company, having given evidence,

Mr. Simon, K.C., addressed the Court on behalf of the first-named Company; and the inquiry was adjourned.

Next morning, Mr. Balfour Browne replied for the Corporation. He said the other side admitted that when a trader wished to do the unloading when merchandise arrived at a station, he was entitled to a rebate; and he contended that if any accommodation and terminal charge were included in the rate, the Corporation were entitled to have an allowance. The Railway Companies denied that they were charging for accommodation; but he asked the Court to draw the inference that the rate did include a terminal charge. If the Companies were to be allowed to succeed in this case, no power would be able to find out what was being charged for accommodation or terminal service. The sorting of the trucks was not a terminal charge at all; it was part of the conveyance rate to the applicants' gas-works. This charge for sorting was, therefore, entirely outside their power; it was not done for the convenience of the Corporation, but simply for that of the Companies. Counsel then proceeded to point out that disintegration of rates charged by the Midland Company showed there was a terminal charge of 3d. a ton at Lawley Street for traders, and said it was difficult to understand why they now said that only 1d. was the terminal charge to the Corporation. The Midland Company admitted that there was a 3d. terminal rate on coke; and he asked the Commissioners to infer that there was also a terminal charge of 3d. on coal. He contended that the Company's figures as to disintegration were not genuine, but were arranged to suit their own purpose when asked to allocate the amounts charged for conveyance and for station accommodation. He claimed that there were terminal charges on all rates.

At the conclusion of Counsel's address, the Court reserved judgment.

## Wrongful Abstraction of Water.

From the evidence tendered during the hearing of two cases at the local Police Courts last week, of wrongful abstraction of water from the mains of the Oldham Corporation, it would appear that motor-lorry drivers are the worst offenders. For the prosecution, it was submitted that, though the value of the water taken was not of great importance, danger might ensue through persons taking a supply from unauthorized places, because the pressure in the out-townships was very great, that there might be serious results at any time when such a thing was done. At the Royton Police Court, last Wednesday, William Pettiford, a motor-lorry driver in the employ of Messrs. C. T. Faulkner and Co., of Manchester, was fined 5s. and costs. He pleaded that, as the boiler of his motor-lorry was empty, he had to get water from somewhere. Mr. Arthur Andrew, the General Manager of the Gas and Water Departments of the Oldham Corporation, had written the defendant's firm advising them to take out a permit to abstract water; but they replied that it would not pay them to give £1 per annum for water taken from street hydrants, as they used so little. A similar case was heard on Thursday at the Manchester County Police Court; the defendant being another motor-lorry driver employed by the same firm. It was alleged that the driver filled the boiler of his motor-lorry by means of a suction pipe which was attached to the main, and by carrying buckets of water from a pipe outside a public-house at Failsworth. Defendant said the landlord gave him permission to take the water; and under the circumstances he was only fined 5s.—the Stipendiary (Mr. Yates) remarking that in a previous case the Bench inflicted a heavy penalty.

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Mr. A. E. Fisher, formerly Government Inspector of Schools in Somerset, was found dead in bed at the Half-Moon Hotel, Exeter, last week, having apparently poisoned himself by gas.

# MISCELLANEOUS NEWS.

## ALLIANCE AND DUBLIN CONSUMERS' GAS COMPANY.

The Half-Yearly General Meeting of the Company was held last Wednesday—Alderman W. F. COTTON, D.L., J.P., in the chair.

The SECRETARY AND MANAGER (Mr. Francis T. Cotton) having read the notice convening the meeting, the report and accounts for the six months ended Dec. 31, to which reference was made in last week's "JOURNAL" (p. 937), were taken as read.

The CHAIRMAN, in moving the adoption of the report, expressed his regret at having to state that there had been a falling-off in the sale of gas in the six months to which it related, when compared with the corresponding period of 1907. This was attributable to several causes. In the first place, there was the great depression in trade, which had affected adversely the output of gas from nearly every undertaking in the kingdom; secondly, the exceptionally mild weather experienced during the autumn and winter months; and, further, there were the many competitors, such as suction and power gas and the electric light. Then there had been introduced the inverted incandescent gas-burners, which, so far as light and cheapness were concerned, surpassed in economy all other means of artificial lighting. When making comparison with the half year ended December, 1907, it must be borne in mind that during the months of August, September, and October the Company supplied a large quantity of gas to the International Exhibition. However, the past half year was a very bad one for gas undertakings generally. On referring to the accounts, the proprietors would find that the increased cost of coals and the falling-off in the gas-rental and receipts for residual products would account for having to make use of the reserve fund, which existed for the purpose, and drawing therefrom £9950 to make up the dividends recommended by the Directors. There had been a considerable reduction in the receipts for residual products. When he addressed the proprietors last September, he was under the impression that coke would demand, if not a higher price, at all events the price they were then receiving. This, however, had not been the case. Though coals cost 3s. per ton in excess of the corresponding period of 1907, the Directors were obliged to reduce the price of coke in order to compete with the markets; the result being that the receipts under the head of "residual products" were less by £1778. He was pleased, however, to be able to announce that the situation had changed for the better. They had entered into contracts for twelve months' supply of coal at a considerable reduction in price. These contracts would come into operation immediately on the present stock of coal, which was purchased in October, 1907, being worked out. He was glad to say the public were beginning to appreciate the great advantages to be derived from cooking and heating by gas. During the half year under review, their people fitted up 2102 automatic installations; a cooker being in each case supplied with a gas-bracket or two, and in addition a pendant, where required. In the same period, there were let on hire 336 cookers and 208 heating-stoves; 56 free cookers were connected with consumers' fittings, in addition to which there were purchased and fitted by consumers 14 cookers, 198 heating-stoves, and 72 gas-fires. There were laid 6684 yards of new mains of various sizes, ranging from 3 to 12 inches in diameter, and 2646 new service-pipes. They had also put in 3835 new meters, nearly all of them being for automatic supplies. In order to meet the overdraft at their bankers, the Directors issued additional capital to the extent of 5562 £10 shares, which were disposed of by auction, in accordance with the provisions of the Company's Acts. They realized £68,014, including a premium of £12,394. The latter sum, being premium capital, could only be used for capital purposes; it bore no dividend or interest. Immediately after the termination of the meeting, a special one would be held for the purpose of obtaining the consent of the proprietors to a Bill now being promoted to confer additional powers on the Company. The object the Directors had in view was to place the undertaking in a similar position to that of nearly every other in the kingdom, whether the property of a local authority or of a private company. No doubt the proprietors were all aware that from time to time complaints of the price of gas had been made. Well, so long as the Company were labouring under their present disabilities, they would have similar complaints. The Directors' object was to be in a position to furnish an article of commerce such as was supplied in nearly every other city and town, with the exception of a few isolated places in Scotland, where the manufacturers had cannel coal at their doors. If the Bill became law, the Company would be in a position to sell gas at a reduced price. There were provisions seeking power to supply gas of a standard of 14 candles, in lieu of 16 candles as at present. He did not think it was at all likely that Parliament would refuse to place Dublin, as regards its gas supply, under similar conditions to those which were in operation in nearly every other city and town in the United Kingdom. He should mention that there was no apparent difference between the light produced by 14 and 16 candle gas when consumed in incandescent burners. After providing for the payment of interest on the debenture stock and the overdrafts at their bankers, there remained £25,056 to be carried to the profit and loss account. The Directors recommended the payment of dividends at the rates of 10 and 7 per cent. per annum on the respective shares. This, as he had said, would involve the withdrawal of £9950 from the reserve fund, but a balance of £43,255 would remain to the credit of the fund. He might point out that this fund could only be used for the purpose of making up dividends.

Mr. CHARLES LAWLER, J.P., seconded the motion; and it was carried.

On the motion of the CHAIRMAN, seconded by Mr. J. MURPHY, the salary of the Secretary and Manager was increased £200 a year.

The dividends recommended having been declared, and the retiring Directors and Auditor re-elected, the business of the ordinary meeting concluded.

Subsequently a special meeting was held for the purpose of obtaining the proprietors' sanction to the promotion of the Bill referred to by the Chairman. The Law Agent of the Company (Mr. E. Fitzgerald) explained the various clauses; and the Chairman added that they were of quite the ordinary character. On his proposition, the Bill was approved of.

Mr. DAVISON proposed a vote of thanks to the Chairman, Directors, and Officers of the Company. He said anybody who read the reports of the Corporation meetings would see the ill-feeling that existed towards the Company. The Directors had conducted negotiations with the Corporation in a very friendly and gentlemanly way, and had given them no cause for their unreasonable attitude.

Mr. JOHN M'BRIDE seconded the motion, which was passed by acclamation.

The CHAIRMAN, in reply, said the Company were in a totally different position from the Corporation, who were in the happy position of being able to call on the rates to make good any deficiencies in connection with their electric light undertaking. Up to the present time, £54,000 had been made up out of the rates as losses on the electric light; and this year the rates would be saddled with something like £11,000 on the same score. This did not surprise him. It would be a long time, so far as he could see, before the Corporation would make any profit out of their electric lighting. The general public did not know the amount of money lost on the undertaking. During all the time the plant was wearing out, while there was nothing going towards depreciation. Ultimately a great portion of the apparatus would be scrap.

Mr. M'BRIDE said that in his township there was a serious loss on the electric light.

The CHAIRMAN: You are a ratepayer, why submit to it?

Mr. M'BRIDE: I am only one of a crowd.

The proceedings then terminated.

## BRITISH GASLIGHT COMPANY.

### Financially a Good Half Year—Assisting the Distressed Unemployed—Reduction in Price at Norwich.

The Half-Yearly Meeting of the Company was held last Wednesday, at the London Offices, No. 11, George Yard, Lombard Street, E.C.—Mr. J. HORSLEY PALMER in the chair.

The SECRETARY (Mr. A. W. Brookes) read the notice convening the meeting, the Directors' report for the half year, the Auditors' report, and, in compliance with the Act of Parliament, the accounts of the Norwich station. The Directors' report was as follows:—

The Directors submit the half-yearly accounts of the Company to Dec. 31 last, as examined and certified by the Auditors, who have also vouched for the correctness of the several investments held by the Company.

The available profit is £27,206, after deducting the following sums (excluding shillings and pence): Income-tax, £1775; Hull debenture interest, £2137; Norwich debenture interest, £1681; Potteries debenture interest, £665; Trowbridge debenture interest, £166; and interest on debenture stock, £2280—total, £8704.

HULL.—The gas-rental shows an increase of £1098, as compared with that of the corresponding period of 1907; the price of gas having been the same—viz., 2s. per 1000 cubic feet. Coke shows a decrease of £481; tar and tar distilling, of £511; and ammoniacal liquor and sulphate of ammonia, of £457. Coals have cost 14s. 3d. per ton, as against 13s. 11d. Coke has realized 11s. 4d. per ton, as against 11s. 5d. The gas sold was 627,842,142 cubic feet, against 621,122,625 cubic feet in the corresponding period of 1907—an increase of 6,719,517 cubic feet, or equal to 1·08 per cent. Of this quantity, 43,965,000 cubic feet was supplied in bulk to the Corporation for the supply of the Old Town. The profit realized is £411 in excess of the parliamentary interest. This sum has been invested, making the reserve fund £34,009.

NORWICH.—The gas-rental shows an increase of £1600, as compared with that of the corresponding period of 1907; the price of gas having been the same—viz., 3s. 3d. per 1000 cubic feet. Coke shows an increase of £268; and tar and ammoniacal liquor, of £188. Coals have cost 17s. 8d. per ton, against 17s. 9d. Coke has realized 15s. 8d. per ton, against 15s. 7d. The gas sold was 250,983,900 cubic feet, as against 244,712,800 cubic feet—an increase of 6,271,100 cubic feet, or equal to 2·56 per cent. The profit realized, after writing off £4000 on account of reconstruction of works, is £1929 less than the parliamentary interest.

POTTERIES.—The gas-rental shows a decrease of £177, as compared with that of the corresponding period of 1907; the price of gas having been the same—viz., 2s. 6d. per 1000 cubic feet. Coke shows a decrease of £79; tar, of £677; and ammoniacal liquor and sulphate of ammonia, of £342. Coals have cost 11s. per ton, against 10s. 10d. Coke has realized 8s. 5d., against 8s. 2d. per ton. The gas sold was 176,395,877 cubic feet, as against 178,875,934 cubic feet—a decrease of 2,480,057 cubic feet, or equal to 1·38 per cent. The profit realized, after writing off £2000 on account of buildings and plant thrown out of use, is £653 less than the parliamentary interest. This sum will be taken from the reserve fund, leaving a balance of £4589 to the credit of that account.

TROWBRIDGE.—The gas-rental shows a decrease of £39, as compared with that of the corresponding period of 1907; the price of gas having been the same—viz., 3s. per 1000 cubic feet, with discounts. Residual products show a decrease of £202. Coals have cost 17s. per ton, against 16s. 10d. Coke has realized 12s. 3d., against 12s. 7d. per ton. The gas sold was 36,712,676 cubic feet, against 37,049,576 cubic feet—a decrease of 336,900 cubic feet, equal to 0·90 per cent. The profit realized is £334 less than the parliamentary interest.

HOLYWELL.—The gas-rental shows an increase of £66; and residual products, of £25. The profit realized is £500.

The available profit added to the previous balance of profit and loss amounts to £79,266. From this sum the Directors recommend a dividend at the rate of 10 per cent. per annum, free of income-tax. This will amount to £24,500 and leave a balance of £54,766.

The CHAIRMAN, in moving the adoption of the report and accounts, said he had frequently pointed out, at their meetings and in another place, how a gas company was like a barometer reflecting the trade of the country. There was no business which told more definitely how trade was going than a company like their own. The result of the half year, though satisfactory to the Directors and, he was sure, to the shareholders from the financial point of view, was not so satisfactory from the point of view of the increase in the gas sold. The shareholders would have learned from the report that the increase at Hull was only just 1 per cent. At the Potteries, there had been a small decrease, as well as at Trowbridge. But there was an increase of 2½ per cent. at Norwich. So that over the whole business of the Com-

pany, there was only an increase of 1 per cent. for the half year. He was glad it was not worse, because, during the visit the Directors paid to the two principal stations within the past fortnight—Hull and Norwich—both of the Engineers reported a deplorable state of affairs in regard to the trade of the towns; and they also heard from the Potteries, through their friend Mr. Woodall (who was interested in Potteries business generally), that everybody down there—bankers, merchants, and even the Company's own collectors—said how difficult it was to obtain money from customers. Of course, in times like this, the consumers of gas were always striving to cut down their gas consumption by closing their business premises and shops earlier than usual. This was why the gas business had not expanded in the way he had had to report at previous half-yearly meetings. He was sometimes glad that the great expansion they saw in certain suburban companies did not come to them, because it gave them a little breathing time to look round, and see how they could improve their property, both in regard to the works and office accommodation. He would give a few interesting items with respect to what had been done at the different stations during the half year. On their visit to Hull, the Directors found everything in perfect order, and also looked into one or two interesting matters, about which he would tell the shareholders. First of all, the Company were much cramped with regard to their office and stores accommodation in Baker Street; and taking advantage of some property falling into the market immediately adjoining their premises, but at the back, and facing another street known as Wright Street, the Directors purchased two houses and back gardens at a moderate figure, which would stand in the capital account at £1660. They still wanted to purchase one more small plot, which they hoped to get for £400; and then they would have the additional land required for enlarging and perfecting the accommodation referred to. A short time ago, he told the shareholders, the Directors established in a prominent position, a very fine show-room at Hull. Unfortunately, they had a fire there during the half year. A considerable amount of damage was done to the top floors and rooms. They were, however, amply insured; and they had received from the Insurance Company quite sufficient to cover the loss. The Company had also taken over the salvage of their own goods, which could be readily cleaned and renovated. The Directors found the show-room in full swing, as if nothing whatever had happened there. A nice addition had been made to the works at Hull. It had always been pointed out to the Directors whenever they went down there that the Hull workmen liked to be dirty. He (the Chairman) could never in his heart believe this was the case. The Board determined to "take the bull by the horns," and put up for the men good washing rooms and mess rooms; they, at any rate, made up their minds to try to influence the men to become better citizens. These rooms were simply but beautifully arranged; and they were nicely heated. There was a good gas-fitted kitchen, where the men could have their meals warmed up; and the arrangements for washing were admirable and well studied. This had "caught on" tremendously; and therefore the stigma of dirty workmen from the British Gas Company's works would not be upon them in future. Of course, at Hull there had been a great deal of distress; and, with he hoped the approval of the shareholders, the Board had contributed £100 to the Hull unemployed distress fund. So much for Hull. Then the Directors proceeded to Norwich. With regard to that city, on the last occasion he told the shareholders there was a balance of Norwich debentures which the shareholders had not taken up. It was only £5000. But after the remarks that he made at the last meeting, some people came in, and, in a short time, the balance was disposed of. The consequence was that now the total amount of debentures which were issued for Norwich had been applied for and taken up. Then another important thing had occurred in Norwich—that was, the reduction in the price of gas. He mentioned at the last half-yearly meeting that they were endeavouring to do this; and he was glad to be able to report that the Directors thought the time had arrived when this reduction should take place—in fact, it came into operation from Jan. 1 last. As the shareholders knew, 3s. 3d. was really a high price for a city of the size of Norwich. The Company had certainly been hampered there with a large capital, and with a heavy expenditure, during the last few years. In order to give the shareholders some idea of what had been done there, he might say that the reconstruction of the works in the past four or five years had cost no less than £71,000; and of this they had been obliged to place £44,500 to revenue, and only £26,500 to capital. Consequently, it had been very difficult indeed for the Directors to lower the price of gas. They had, however, now written off £41,000 out of revenue, leaving only £3482 still to be written off. Therefore, the Board had reduced the price to 3s. He might say this had created great satisfaction in the city; and the Company were now more popular than ever before. In Norwich, again, there had been a certain amount of distress. He said "a certain amount" because it was not so acute there as in other industrial towns. But the Board had endeavoured to meet the situation by advancing certain works which they had contemplated carrying out this summer, in the way of some large main-laying. The Company were now coming to a point in their gas sales at Norwich when they would require additional gas storage accommodation; and they had only one spot on the works where such a holder could be erected. That was at the Bishop Bridge works. They could just squeeze in a holder there, which would have a capacity of 1¼ million cubic feet; and during the coming year, he was afraid they would have to go to this capital expenditure. He did not think there was anything further to be said about Norwich, except that there was a considerable demand for tar there for road purposes. They had put up a small still for taking off the light oils, so that the tar would be better available for the requirements of the City Surveyor. Then with regard to the Potteries, the shareholders were aware they had been gradually removing the old works down to a new and better site close to the railway. At the present time, one of the old holders was being moved down to the new site; and they were also erecting there a new holder of 1,025,000 cubic feet capacity. The distress in the district had been very considerable; and the Directors had endeavoured to alleviate it by making contributions of coke. These were all the specially interesting points at the stations. It would be noticed from the accounts that the half year had been a favourable one, and that they were carrying forward a larger balance than they did on the previous occasion. He sincerely hoped he should be able six months hence to report to the shareholders a similar state of things financially. It might, he hoped, even lead to a small bonus being added to the same dividend they were declaring that day. It was some years since the Directors paid a bonus to the shareholders; and they would certainly do so again if their accounts proved it was possible. There was another matter to which to refer. Only a fortnight after the shareholders met in September, one of the Auditors—Mr. Edward Yardley—died suddenly. Mr. Yardley was elected an Auditor in January, 1867, in the place of his father; so that he had acted for the Company for 42 years, and had done his work exceedingly well. It became a question of what the Directors should do with regard to the appointment of a new Auditor, because, by section 21 of the Companies Act of 1900, which would be confirmed by the Act which came into force on April 1, the Directors had the power to fill any temporary vacancy in the auditorship, and then the appointment of Auditors would be made by the shareholders, in the usual way, at the next general meeting in September. As the shareholders were aware, for many years the Auditors of the Company had not been registered accountants; and the Board thought they would make a departure on this occasion by appointing a gentleman who was well known to many of the shareholders, and also in the accountancy world, and especially in the gas profession. They had therefore asked Mr. William Cash if he would take up the duties on this occasion. He (the Chairman) was glad to be able to report that he had acquiesced. As they had heard on this occasion, Mr. Cash had signed the accounts; and, at the next general meeting, it would be for the shareholders, if they thought fit, to re-elect him. He hoped the shareholders thoroughly approved of the choice the Board had made. One other matter to which he had to ask the sanction of the shareholders was the contribution the Board had made to the memorial to Sir George Livesey. He was not going to enter into an account of what Sir George Livesey did for the gas industry generally; but the Directors considered it only right they should contribute £200 to the fund which was being raised to establish a professorship at Leeds University in his memory. He trusted the shareholders would approve of what had been done in this respect.

Mr. F. WILKIN seconded the motion, which was unanimously carried.

Proposed by the CHAIRMAN, and seconded by Mr. CORBET WOODALL, a dividend was declared at the rate of 20s. per share, clear of income-tax.

On the motion of Mr. R. B. FITZMAURICE, seconded by Mr. B. FRANCIS HARRIS, a hearty vote of thanks was passed to the Chairman and Directors.

The CHAIRMAN having acknowledged it on behalf of himself and his colleagues,

Mr. LEONARD R. WILKINSON proposed, and Mr. CORBET WOODALL seconded, a vote of thanks to the Secretary, the Engineers, and staffs generally, both in London and at the different stations. The mover spoke in high terms of praise of the work of all the officials.

The motion having been cordially adopted,

The SECRETARY replied, saying how greatly he and the officers and staffs generally appreciated the vote.

This concluded the proceedings.

## PROGRESS OF THE KEIGHLEY GAS UNDERTAKING

### Under Mr. John Laycock's Management.

In connection with the forthcoming retirement of Mr. John Laycock, who has (as announced in our "Personal" column to-day) for the past 42 years occupied the position of Engineer and Manager of the Keighley Corporation Gas-Works, the following particulars of the progress of the undertaking under his care will doubtless prove of interest.

Keighley's first gas-works were erected in 1825, on a site at Low Bridge; and in November of that year the town was lighted with gas for the first time. It was one of the first towns in the kingdom to be lighted with gas from works erected by the local authority. As the town enlarged and the manufacture and distribution of gas became more understood, its use became more general, with the result that from time to time the plant had to be re-arranged and enlarged; the available land on both sides of the river being purchased for the purpose. For a considerable number of years after their erection, the works did not pay working expenses, and had to be supported from the rates. The extension of the works at Low Bridge was, however, put a stop to in 1873 by the Great Northern Railway Company requiring a portion of the works and land for the purpose of constructing the line from Halifax to Keighley. The Local Authority received £19,300 for the land required by the Railway Company, and at once took steps with a view to the erection of works elsewhere. Eventually land was purchased at Thwaites; and the erection of the present works was begun in March, 1875. They were pushed on with remarkable celerity, and on Dec. 5, 1876, were officially opened. The whole of the works were designed by, and erected under the supervision of, Mr. Laycock; and the present satisfactory position of the undertaking is a tribute to the thoroughness of his work and the care and skill exercised in the management. Since the present works were erected, every effort has been made to keep abreast of the times; and to-day the works are equipped with the latest apparatus for the manufacture and distribution of gas.

When Mr. Laycock took up his duties in the gas office in 1860 (seven years before he became Manager), the expenditure on capital account was £13,706; there was a debt on capital account of £6000; and there was nothing to the credit of working capital, sinking fund, or renewals and insurance accounts. In 1867, when Mr. Laycock was appointed Manager, the expenditure on capital was £20,076; the debt on capital was £6000; and there was still nothing to the credit of working capital, sinking fund, and renewals and insurance. At June 30, 1908, the expenditure on capital was £142,550; the debt on capital was £82,162; the working capital account had £15,000 to its credit; £5657 had been

set aside as a sinking fund; and £14,107 had been reserved for renewals and insurance. In 1860 and 1867, the price charged per 1000 feet to residents in the borough was 4s.; in 1908, the prices were 1s. 5d. and 2s. 1d. In 1860, the total number of consumers was 1415; in 1867 they had increased to 2366; and in 1908, to 13,675. In 1860, public lamps numbered 256; compared with 300 in 1867; and 1718 in 1908. In 1860, 2390 tons of coal were used for gas making; 21,260,000 cubic feet of gas were made, representing 8895 cubic feet per ton of coal; 17,620,000 cubic feet of gas were sold, or 7372 cubic feet per ton of coal used; the minimum number of employees in summer was 6, and the maximum number in winter 11. In 1867, 4552 tons of coal were used; 40,535,000 cubic feet of gas made, or 8904 cubic feet per ton of coal; 34,046,000 cubic feet were sold, or 7479 cubic feet per ton of coal used; and the minimum number of employees in summer was 20, and the maximum in winter 34. In 1908, 28,984 tons of coal were used; 337,372,000 cubic feet of gas were made, or 11,640 cubic feet per ton of coal used; 321,614 cubic feet of gas were sold, or 11,096 cubic feet per ton of coal used; and the minimum number of employees in summer 129, and the maximum in winter 154.

The profits made, after paying interest on the debt, from 1825 to 1866, amounted to £19,178, which was used in the reduction of the debt on capital. The profits, after payment of interest on the debt, from 1866 to 1908—being the 42 years Mr. Laycock has been responsible for the management—amount to £326,074. These profits have been apportioned as follows: £42,878 to capital account for new works, plant, &c.; £21,000 to writing off capital for obsolete works and plant; £63,682 to sinking fund account for extinguishing debt; and £41,726 to reserve fund, renewals, and insurance account for replacing worn-out and obsolete plant, stoking machinery, &c. These amounts, totalling £169,286, were devoted solely to gas-works purposes, and left a balance of profit amounting to £156,788, which has been allocated as follows: £56,777 to the Finance Committee in aid of rates; £22,470 to the cost of public lighting; £50,770 to the Water Committee in aid of the water-works; £17,924 to the Fire Brigade Committee for maintenance of the Corporation Fire Brigade; £937 to cost of Specification of Patents Library; and £400 to cost of town survey and subscriptions to the Cottage Hospital. These make a total of £149,278, and leave £7510 profit in hand at present. The above sum of £149,278 apportioned during the last 40 years equals £3732 per annum—indeed, the amount during the last 10 years has been over £6000 a year. In addition to these apportionments from profits, large amounts have been annually paid direct for rates from revenue account.

As to the present value of the gas-works property, Mr. Laycock's estimate is as follows: Value of the works, plant, and property, £240,000; surplus land near gas-works and the site and buildings at the electricity works, still unpaid for, £12,000; amount of floating capital in hand, £15,000; amount of renewals and insurance fund in hand, £14,108; amount of sinking fund in hand, £5657; balance of profits in hand, £7560. This gives a total value of the gas estate of £294,325, less the debt on capital account of £82,162, leaving £212,163. The works are in excellent order; and the new stoking machinery and coke-conveying plant promise to be a complete success.

It is interesting to note that Mr. Craven, the Manager whom Mr. Laycock succeeded, is still living.

## The Suggested Inquiry as to Disused Sewers.

The Borough Engineer for Camberwell (Mr. William Oxtoby) has prepared a report upon the circular-letter sent out by the Local Government Board with reference to the explosion in Grange Road, Bermondsey. The Board asked if the Council had any observations to make in regard to a suggested inquiry in reference to disused sewers in London. Mr. Oxtoby says there can be no doubt that leaving old and disused sewers without constant inspection and attention is a serious source of danger. In Camberwell, however, it has always been the practice to break up and fill in old sewers; so that, as far as that borough is concerned, any inquiry is unnecessary. He thinks that such filling up should be made compulsory everywhere. But to his mind the more important question is that of obtaining stronger powers to prevent the practice adopted by several companies of laying their mains through the brickwork of sewers, gullies, and manholes, and other work in direct communication with sewers. This, he says, is frequently done, and is very difficult to detect unless an officer is constantly standing over the men at work. Whenever mains are so run through and built into the brick or concrete work and there is a settlement of the adjoining ground, the two are sure to be affected unequally; and in consequence the weaker—this being usually the main—has to give way. When this happens, whether the sewer is out of or in use, the water or gas is bound to find its way into the sewer, and immediately renders it a source of danger—the gas by explosion, or the water by washing away the soil and causing large cavities under the highway. Mr. Oxtoby is aware that companies' work in laying new mains is greatly hampered by the ground under the highways being crowded with pipes of various kinds, and that it is almost impossible to avoid the practice mentioned. In many cases, the different mains are not only crowded together throughout the whole width of the road, but are several tiers deep. It has become a matter of extreme difficulty, in certain places, for the Council to get sufficient space for opening down to the sewers, either for inspection or to put in connections to house drains. He urges, in conclusion, that serious objection should be raised to the conferring of any future powers giving a right to occupy the subsoil of a highway. Copies of the report are to be forwarded to the Local Government Board and the Board of Trade.

**Price of Gas in the Bognor Out-District.**—The passing of the Bognor Gas Company's Bill has been reported to a parish meeting at Barnham, and that district will now be supplied with gas for the next five years at a standing price of not less than 6d., and not more than 8d., per 1000 cubic feet above the Bognor charges. After this period, the charge is not to exceed the Bognor price by more than 6d. The terms were considered satisfactory.

## BIRMINGHAM CORPORATION GAS DEPARTMENT.

### Staff Dinner—Progress of the Undertaking.

In the Grosvenor Rooms at the Grand Hotel, last Tuesday evening, the City of Birmingham Gas Department held their Staff Dinner, which on this occasion included those over eighteen years of age who are engaged both on the different works and at the Council House. The Secretary, Mr. G. Hampton Barber, occupied the chair; and a party of about 200 sat down—among the guests being Aldermen Sir Hallewell Rogers and J. H. Lloyd, and Councillors Harrison Barrow, Murray, Wilson, Toller, and T. E. Smith. Mr. Charles Hunt and Dr. H. G. Colman were also present. The arrangements, which were in the hands of a Dinner Committee, to which Mr. W. Wastell acted as Hon. Secretary, were admirably carried out; and a most enjoyable evening was spent. During dinner the Grand Hotel Orchestra performed; and the subsequent toast list was interspersed with music and song. A feature of the programme and menu was an appropriate selection of quotations. Most of these were from Shakespeare; but the authorship of the following lines, which headed the menu, was not stated, though it deserved to be: "We'll turn stokers for an hour. See to it there are no light charges." The Loyal Toast was first submitted by the Chairman and duly honoured; and then some interesting speeches were made which had a direct bearing on the Birmingham gas undertaking.

Mr. Walter Chaney, the Engineer-in-Charge of the Nechells Works, proposed "Our City," and remarked that there were very few towns where so much progress had been made as had been the case in Birmingham during the last fifty or sixty years, while he thought there were no cities that had claimed so many eminent men. Birmingham had been called the workshop of the world; and it had been able to dispose of its wares wherever commerce was established. They who served the Corporation in the various departments knew that such progress as had been witnessed could not have been made without some initiative. They knew how much they were indebted to the municipal and city authorities and to the public spirit of the gentlemen who formed the City Council. Everything was done to maintain the position of Birmingham; and assistance had been rendered in such a manner that technical education was now available to all. With all these surroundings, there was no doubt whatever that progress must continue.

Alderman J. H. Lloyd, in reply, said Birmingham men were always loyal to their city, which was a good point in their character. He would like to take the opportunity of congratulating the Chairman on the very successful gathering that had been arranged that night. Some of those present had had to do with the Gas Department for a great number of years. He was glad to see among them his friend Mr. Charles Hunt, who was Engineer for a long time; and he was also pleased that Dr. Colman was with them. They were very fortunate in their staff, and were grateful to them for what they did. They wanted them all to feel that they belonged to a great department of a great city. In the past, gas had made vast strides; and it had a great future before it. Never had the problems connected with gas been more studied than of late; and there were evident signs that still greater progress would be made. It was a pleasure to be connected with such a department.

Mr. W. H. Powell, Chief Cashier, submitted "The Gas Committee," who he said had been in existence for thirty-three years, and who might look back over this long period with pardonable pride at the successful results that had been achieved. Not the least gratifying fact was that the last year had been the most successful of them all. These results were largely attributable to the able men who had always served on the Committee. He only recollected two instances in which any recommendation of the Committee had been rejected by the Council. One of them was on the thorny question of salaries, and was subsequently adopted; while the other was on a point of administration which was really of little consequence. He could not call to mind any case in which a member of the Committee had lost his seat at a municipal election owing to dissatisfaction with his work on the Committee. The relations with the staff had been most cordial—the Committee always showing a warm appreciation of the work done. He wished to tender to the Committee their hearty thanks for the generous support they had accorded in connection with these proceedings. He coupled with the toast the name of the Chairman of the Committee. They were all interested in the high position occupied in Birmingham by Alderman Sir Hallewell Rogers; and perhaps he might be excused for thinking that this was partly due to his admirable chairmanship of the Gas Committee.

Alderman Sir Hallewell Rogers, in responding for himself and his colleagues, remarked that they esteemed it a great compliment that the toast should have been proposed by Mr. Powell, who had been with the Gas Department considerably over thirty years, and had won the highest respect. This was one of the first opportunities the Committee had had of seeing the faces of some of the staff; but he hoped it would not be the last. He was sure that every member of the gas staff did his best, owing to the inspiration that filtered down from the chief member of the staff, Mr. Hampton Barber. Were not this the case, they could not have achieved the results that had been attained. It was in 1875—about thirty-three years ago—that the gas undertaking was acquired under Mr. Joseph Chamberlain. Since that time there had been eight Chairmen, of whom Mr. Chamberlain was the first. Some of the other Chairmen were present with them that night; but he was sorry Alderman Bishop was absent. Alderman Bishop was the oldest member of the Committee. He joined in 1878; and he had been for fifteen years Chairman of the Works Sub-Committee. During the thirty-three years that the city had had possession of the gas-works, everything practically had doubled except the capital expenditure of the business, which had only gone up 25 per cent., owing to the good management—he would not say of the Committee, but of the Committee and staff combined. In 1875, the capital was £2,000,000; and now it was £2,500,000. The coal carbonized was then about 300,000 tons; while now it was, roughly speaking, 600,000 tons, and he would throw the oil in. The rentals had gone up from £344,000 to

£720,000—or more than double. They had had three Secretaries—first Mr. Henry Parry, then Mr. Edwin Smith, and now Mr. Hampton Barber, who was the most energetic man he had ever met, and who meant to make the department go, whether they wanted to go or not. He himself knew something of business life; and he was struck with the smoothness of the working of the Gas Department. It was, he supposed, the largest concern in the city; and yet it went like clockwork. The reason was that every man connected with it meant to make the business a huge success. Alderman Lloyd had said there was a great future for gas. He hoped this was so; but there was no future for any concern unless everyone, from the office-boy upwards, had his heart and soul in the work. It was the feeling of confidence they had in each other that would make a great success of the department in the future. People talked about the amount given to the rates; but they did not know how much they might be going to give them. There might come a time when the Gas Department would pay all the rates of the city; and, if so, it would be due to those he saw before him.

Mr. Charles Hunt, M.Inst.C.E., proposed "The Chairman." He said that personally he felt much indebted to Mr. Hampton Barber for this opportunity of being once more among old friends, and seeing around him so many familiar faces; and for himself and Dr. Colman he wished to return thanks for the hearty welcome that had been extended to them. He was not likely to forget, or to lose his interest in, the city in which so many of the years of his life had been spent, nor that department of its administration in the moulding of the destinies of which he felt he could lay claim to have had some share. Besides being Chairman that evening, there was another aspect in which Mr. Barber had to be regarded, and a much more important one—that was as the chief executive officer of this great department. Without the cordial co-operation of Mr. Barber and those who worked under him, the efforts of the Gas Committee would be of little avail. The position occupied by Mr. Barber was one of great honour, and still greater responsibility. He had not only to keep the machinery of a vast organization going with as little friction and as much useful effect as possible, but he had to satisfy the requirements of many thousands of consumers, and to provide a contribution to the municipal exchequer. He saw that the comparatively modest sum of £25,000, which was for many years more or less the contribution, had been during the last few years—he thought it almost dated from the time when Mr. Barber took office—increased, until it had reached the very large sum of £61,000, notwithstanding which the price of gas had been reduced. He thought he was right in saying that the average price now was lower than it had ever been before. Whatever opinions they might hold as to the policy, under existing circumstances, of subsidizing the rates—and he noticed Sir Hallewell Rogers rather hinted at a much larger contribution in the future—such a result was convincingly indicative of excellent management, and it was a title to the gratitude of both ratepayers and consumers. It had been achieved, moreover, in the face of competition which was growing keener every year, and of industrial conditions which had all tended to make more difficult the economical production of gas. It was indicative also of the desire and intention on the part of the Executive to keep abreast of the times. The period had gone by when business could be had without the asking. The conditions under which gas undertakings were carried on had become entirely changed. There might be, and he had no doubt there was, a great future for gas; but it was a future which they would have to make for themselves. Prosperity would not come if business was not sought, or if they failed to keep abreast of the improvements which were going on.

Mr. Hampton Barber, in responding, expressed the gratification of the staff at the presence of the members of the Gas Committee. One member especially, who rendered the Committee great assistance, he wished to name, and that was Councillor Toller. He did not intend to go into figures. All that he would say was that the undertaking was making steady progress; and it was absolutely impossible for it to do this without the cordial sympathy and help of all those who were present that evening. He recognized this; and he was proud of his staff, and pleased to have this opportunity of meeting them. Progress had been made in past years; but they hoped to make still greater progress in the future. He believed gas was only in its infancy. When he first joined the department, the output was 5600 million cubic feet; while last year it was over 7000 millions. The income had correspondingly increased; but they had not extended their business at the cost of a big capital outlay. The capital had not gone up a penny piece since he joined the department. They were still at the same capital, although they were contributing to-day a much larger sum to the rates. This was the result of the labours of the staff. The engineers, and everyone (from the seniors to the juniors) co-operated most loyally in striving for the success of the undertaking; and so long as they continued to do this, there need be no fear with regard to the contributions to the rates. Possibly they would even be increased; he hoped for that. He trusted that this would prove to be the first of a series of annual gatherings of the same kind. The Dinner Committee deserved their thanks for the manner in which they had carried out the arrangements. They had done excellently well.

**Assessment of the Dowlais Gas-Works.**—The Assessment Committee of the Merthyr Union recently heard an appeal by the Dowlais Gas Company against the assessment of their works, which are rated at £1750 gross and £1100 net. Mr. D. W. Jones, who appeared for the Company, explained that in 1907 the Company made 45 million cubic feet of gas, and sold about 36 millions. In 1908, they made 42 millions, and sold 33 millions. Replying to a question as to how he accounted for the great difference between the make and sale, he said there was always an enormous leakage of gas, which was probably greater in Dowlais than in other places, because of the very heavy traffic to the steel-works. The Chairman (Mr. Rees Rees) asked whether any reduction had been made in the price of gas. Mr. Jones said there had not. Messrs. Guest, Keen, and Co. used to have preferential terms until the Company got their Act of Parliament; but now they had no preference. The Committee resolved to reduce the assessment to £1640 gross and £1000 net.

## GAS-MAINS AND TRAMWAY LINES IN SHANGHAI.

### Liability of the Municipality for Breach of Agreement.

In the summer of 1907, the Shanghai Gas Company instituted proceedings, in the Court of Foreign Consuls, against the Council for the Foreign Community of Shanghai for having committed a breach of an agreement entered into with them, by granting to the Shanghai Electric Construction Company, Limited, permission to open the Canton Road for the purpose of laying their tramway lines on the same side as the Company's main; the Company protesting against the Council's action, on account of the proximity of the rails. They said they could lay an alternative main on the opposite side of the road, at an estimated outlay of £450, together with the cost of any service-pipes which might have to be renewed; but the only reply they received from the Council was that the matter must be settled by the two Companies concerned. The permit was issued in due course, and the tramway track constructed. The Company then applied to the Council to submit the question to arbitration; but they refused to do so. Hence the appeal to the Court, who decided that arbitration was the only proper way of settling the dispute. The Council, however, were dissatisfied with this decision, and applied for a rehearing of the case; but without success. The matter was accordingly referred to Mr. F. S. A. Bourne, who held the inquiry early in July last. The Company's case was stated by Mr. R. N. Macleod; Mr. L. E. P. Jones appearing for the Council. The Arbitrator made his award in favour of the Company on the 24th of August; and, in view of the interest attaching to the question at issue, we give it below, in full.

The issues I have to determine are: Have the Council broken their agreement with the Gas Company; and, if so, what damages or reparation ought they to pay or make to the Company in consequence? As to the first issue, I determine that the Council have broken their agreement with the Company. To avoid misunderstanding, I must state my reasons for this part of my award at some length.

The first reference to the Gas Company in the Council's published reports, to which my attention has been directed, is under the date of Sept. 14, 1864, and reads as follows: "Lighting. The Engineer submitted a sketch of the points at which the lamps of the Gas Company would shortly be fixed." After prolonged negotiations with the Gas Company, noted in the municipal reports *passim*, it was proposed by the Finance, Rate, and Appeal Committee, in their report for the year ended March 31, 1866, that a rate of 1 per cent. on rentals be charged to cover the cost of illuminating the English settlement with gas. The supply of gas for public lighting went on under temporary arrangements between the Council and the Gas Company, no doubt recorded by an exchange of letters, until 1898, when for the first time a written contract was concluded. This contract was amended and renewed by an agreement in writing dated Aug. 5, 1902, which has been renewed from time to time and is still running, with this modification, however, that on July 21, 1905, it was agreed by letters between the Council and the Gas Company that the latter should allow the Council a discount of 25 per cent. on all sums payable to the Company on account of public lighting in consideration of the privilege which the Company enjoys of the use of the municipal roads for its pipes and mains. The discount amounted in 1907 to over $7500. The written contracts refer almost entirely to public lighting.

On reviewing the above relations between the Council and the Company, it is clear to me that the whole of the contract between the parties was never reduced to writing. The community desired gas in 1865 in the same way that they desired tramways in 1904. The Gas Company agreed to supply gas to those who chose to pay for it; and the Council agreed, in consideration of the community's desire being met, to allow the use of the roads to carry the mains. Such a contract would have been implied in law, because the Court must have held that this was the intention of the parties. For example, suppose that, after the Company had been allowed to put down their mains, the Council without just cause had refused to allow them to take up the roads in order to connect their mains by pipes with the houses of consumers, the Court must have implied that such connection would be allowed; it being implied that the Council would do nothing without just cause to make the carrying out of gas lighting impossible. It seems to me incompatible with just relations between the Council, representing the public local interests of the community, and the Gas Company—a semi-public concern dealing in a public convenience and doing what is often done by municipalities for themselves—that the Council should say: "We have nothing to do with you except that you supply gas for the public lamps." The letter from the Council to the Company dated July 21, 1905, shows that the Council themselves take a much broader view of their obligations; for they say there, in regard to a stipulation with the Gas Company, that they "are actuated solely by the desire to protect the foreign and native community," &c. I have no doubt that the following term would have been implied all along, and must certainly be implied now that the Company pay for the use of the roads—viz., that the Council should be liable for their wilful and unnecessary act or default causing damage to the mains of the Company under the streets of which the Council has charge. This implied term is founded on the presumed intention of the parties and upon reason. I think, on the other hand, that such a term as that the Council should at no time put down wood or rubber pavement, because this would make access by the Company to their mains more difficult and costly, ought not to be implied, because the Council would not have agreed thereto, for such improvements might at any time become necessary in the public interest. Changes of this sort can, I suppose, be met by adjustments of the price charged by the Company for gas.

The next question I must answer is: Was the act complained of—*i.e.*, allowing the Tramway Company to put their track over the Gas Company's main in the Canton Road—a wilful and unnecessary act, or was it necessary in the public interest? All parties had long notice that tramways were likely to come; and on Feb. 28, 1899, in reply to a letter from the Gas Company, pointing out possible danger to their property from tramways, the Council wrote that "in the event of a concession for public tramways being eventually approved by the ratepayers, the Council will adopt every possible precaution to ensure that the tramway lines are all laid down in accordance with the best modern

practice; and protectionary clauses will be inserted in the agreement with this end in view." And when, in 1905, a concession was granted to the present Tramway Company, a clause was inserted (clause 12) providing that the Tramway Company should make full compensation to all parties for all loss or damage they might sustain by reason of any interference with gas-mains, &c. Now, if the Council were in the position of the Legislature of an independent State, they would be able to make the Tramway Company directly liable to the Gas Company, as is done in England by the Tramways Act, 1870, which provides that a tramway company, when about to commence work, shall give seven days' notice to any gas company having mains in a street they intend to traverse, with a plan and section of the proposed work. If the gas company then require the tramway company to remove their main, the tramway company must, if the demand be reasonable, do so at their own expense, or, in case of difference between the tramway company and the gas company, the Board of Trade appoints an engineer as referee. But the Council, although supreme when acting within the powers granted by the Land Regulations, cannot by its contract with the Tramway Company make the Company liable to an action at the suit of the Gas Company, because a man cannot acquire rights under a contract to which he is not a party. The Council had, or should have had, this principle in its mind when Mr. King-Hillier, the Gas Company's Engineer, wrote to Mr. Leveson, the Council's Secretary, on Dec. 29, 1906, protesting against a permit being issued to the Tramway Company to construct their track immediately over the Gas Company's main in the Canton Road, and should have delayed the issue of the permit until the Tramway Company had come to terms with the Gas Company on the lines of clause 12 of the tramway agreement; the Council requiring these Companies to appoint an arbitrator in case of disagreement. Instead of this, on Jan. 10, 1907, the Council replied to the Gas Company that they had decided to leave the settlement of this question in the hands of the Companies concerned, and that the permit for the construction of the Canton Road track was being issued that morning. That is to say, the Council authorized the Tramway Company to construct their line in the Canton Road over the Gas Company's main. They thus put the Gas Company in the position of not being able to sue on the tramway contract, and of being faced, if they sued in tort, with the defence that the Tramway Company had done no more than the Council had authorized them to do under clauses 1 and 2 of their agreement. Both the Companies must go where they are told to go by the Council, without whose control the various companies using the streets would be in chaos. Some one must exercise paramount control, and therefore accept obligation. If the Council will not, who is to? I find the issue of a permit to the Tramway Company to have been a wilful act, and unnecessary in the public interest.

The only remaining question under the first issue is this: Have the Gas Company actually suffered damage by the tramway track being carried over their main in the Canton Road? In regard to electrolysis, the Council have admitted in writing that "there is a probability (be it small or great) of damage by electrolysis to the Company's pipes in the Canton Road, in consequence of the propinquity of the tramway rails to such pipes or some of them." Mr. Mayne, in giving evidence, in answer to a question by me, said that it would, according to good engineering practice, be better not to leave the gas-main under the tramway track for over half-a-mile. Mr. King-Hillier, the Gas Company's Engineer, pointed out the danger of settlement of the ground—the lead forming the joint being drawn out of the socket, and a leak of gas ensuing, or the pipe might break; also the danger of a pipe breaking that is half embedded in concrete and half in mud. In case of a leak, the gas might make its way under the flooring boards of a house, and be set alight accidentally and cause damage. He considered the danger of explosion greater because of the bed of concrete over the main tending to keep the gas below, instead of allowing it to escape in a vertical direction. Mr. H. J. Hardy, the Outdoor Superintendent of the Gas Company, said that for 20 feet the tramrail was $\frac{3}{8}$ inch above the gas-main, and that the main was partially included in the concrete bed for 100 feet. I can have no doubt that the Gas Company have suffered damage. The Council have therefore, by their wilful and unnecessary act, caused damage to the Gas Company's main in the Canton Road; and for this damage they are liable.

I have followed English law in my award on the above issue, because the case was presented to me by Counsel for both parties from that point of view; but I would add that I arrive at the same result from the point of view of the general law of the Continent of Europe.

Whereas by an agreement in writing dated the 21st day of August, 1908, supplemental to the agreement dated the 1st day of July, 1908, above recited, it was agreed between the parties to this reference that I should first make and publish my award in determination of prayer (*a*) only of the prayers set out in the schedule to the agreement of the 1st of July [*i.e.*, for a declaration that the Council had committed a breach of their agreement with the Company], provided at the same time I stated the principles which, in my opinion, should govern the determination of the remedy to which the plaintiffs may be entitled in the event of that prayer being decided in their favour; and whereas I have above decided prayer (*a*) in favour of the plaintiffs, I now state the principles which, in my opinion, should guide the determination of the remedy to which the plaintiffs are entitled, as follows: The Gas Company should be as far as possible put, at the expense of the Council, in as good a position as they would have been if the question of what ought to have been done in regard to the tramway line and the Gas Company's main in the Canton Road had been referred to an arbitrator before the tramway track was laid; provided that such arbitrator shall be taken to have considered, in making his award, first the public interest and public safety, and then the interest of the two Companies concerned, and to have determined the course the tramway line and the gas-main could most economically follow by considering the space available in the Canton Road for all public and semi-public uses—putting the gas-main, as nearly as local conditions admit, in as favourable a position as it was in before the Tramway Company laid the track, and the Gas Company being charged with any gain that might accrue to them through any change ordered, and not being allowed anything on account of greater difficulty of access to their main where greater difficulty of access was unavoidable, looking to the public interest and local conditions. The Council should not be looked upon as ensuring to the Gas Company as great advantages as they had before the advent of the Tramway Company, but as affording them as much as public safety requires and as existing conditions will reasonably admit. And I further award and order that the Council shall pay the costs to date of this arbitration.

## PUBLIC LIGHTING OF SOUTHAMPTON.

### The Gas Company on the Proposed Extension of Electricity.

It was stated in last week's "JOURNAL" that the Acting Secretary of the Southampton Gas Company (Mr. F. Lewis) had addressed a letter to the Town Council expressing astonishment that the Council should have decided to substitute electricity for gas in a large number of lamps in certain streets of the town without any previous notification of this intention having been previously given to the Company so that the merits of the proposal could have been discussed. In accordance with an intimation conveyed in the letter, the Directors of the Company have submitted to the Corporation the following statements and facts as to the proposals for "changing the existing system of gas lighting for a new form of electric lamps suggested to be only for side streets, but which has already been considerably extended to other localities."

The Borough Electrical Engineer has not given to the Corporation, or in his report to the Sub-Committee of the Highways and Lighting Committee, any idea or estimate of the probable cost of the proposed installation of electric lighting in place of gas. If this is to be paid out of capital, the decision of the London County Council as to Marylebone—refusing to sanction the loan for such purpose—would no doubt be adopted by the Local Government Board on an inquiry being held. Is it not proper that the Council should know from what source the proposed extension should be paid? At present no intimation whatever is given upon this point, although the report has been adopted by the Corporation. This is at least unusual, and forms a bad precedent. The inference of withholding the information as to the probable cost of the change to electricity is that it is found undesirable to publish it.

Are the Council aware that the amount expended by the Corporation in 1905 for adapting the gas-lamps to the incandescent system was about £700, and that for every lamp changed to electricity a proportion of this asset would be wasted? The present proposal of the Electrician—though only a temporary experiment—will cost over £100 for dismantling the gas-lamps. In addition, there will be the cost of the new electric lamps, and wiring same. There will also be the extra cost for lighting by electricity, which, if done at a reasonable profit, will be at least double. The Borough Engineer was instructed to reduce the number of lamplighters at present employed, in consequence of the conversion of the gas-lamps to electric. It is an astonishing fact that the mode adopted for such conversion will still require the attendance of some person to light and extinguish each of the proposed converted lamps. This absolutely negatives the suggestion that lamplighters' wages would be saved.

The Electrical Engineer reports that the number of gas-lamps to be displaced is 336. The Gas Company's Manager states that the number of such gas-lamps in the list of streets forwarded amounts to 430. This great discrepancy requires some explanation. On whose authority was this list of roads sent to the Gas Manager? In the report, the Electrician asks to be allowed to light more of the public lamps in the side streets, as they can give greater candle power at the same price. As it is beyond argument that gas is not half the expense of electricity, it follows that, in the ordinary way, this would be considered reckless trading, if this offer to supply on the terms named was adopted.

No complaint or demand whatever has been made on the part of the public for any alteration or improvement in the gas lighting of the streets where incandescent gas lighting has been installed; but, on the contrary, it is generally acknowledged that the present system of lighting by electricity is most inefficient. This is shown by the Committee's own report that in London Road and the Avenue six additional arc lamps have been found necessary; also that the electric lighting in the High Street was unsatisfactory. It is an important point that there is diminished illumination in the main streets after 11 p.m. by the substitution of incandescent electric lamps for the arcs, which leaves the town more open to depredations at the darkest periods, and deprives the police of the advantage of that preventive of crime—a good light. In addition, frequent failures of the electric current occur.

After quoting a number of facts based on statements which have of late appeared in the "JOURNAL," the document concludes as follows: The Directors are prepared to meet any members of the Corporation and their officials to substantiate the statements contained in this protest, with the view of endeavouring to aid them in arriving, in the interests of the ratepayers, at the most efficient and economical system of public lighting, as they desire to remind the councillors that only one side of this question has, at present, been heard by them, and that on a most meagre report presented to a Sub-Committee of the Highways and Lighting Committee. The Directors feel that the Gas Company are entitled to some fair consideration being shown them in this matter, as the Company are the second largest ratepayers in the Borough, contributing last year no less a sum than £4833 to the total rates of the town, of which £2202 were contributions to the general district rate. The London County Council have appointed a Committee for the purpose of visiting all the large Continental towns, with the view of ascertaining the best system of lighting; and the Directors therefore suggest that it is in the public interest that the Corporation should not commit themselves to the present proposed changes.

**Paris Gas Supply Last Year.**—The "Bulletin Municipal" has lately published the figures showing the consumption of gas in Paris last year. It reached the large total of 13,678$\frac{3}{4}$ million cubic feet; being about 577 millions more than in 1907. The receipts amounted to £3,026,420—an increase of £131,366 on those for 1907. The consumption of gas for public lighting fell off to the extent of about 15,200,000 cubic feet. The gas was sold at an average price of 4s. 4$\frac{3}{4}$d. per 1000 cubic feet.

## BERMONDSEY GAS EXPLOSION.

### Action of the Council.

The Bermondsey Borough Council, acting on legal advice, have instructed the Town Clerk to take out a summons before a Judge in Chambers against the London County Council, applying that they may be restrained by an order and injunction from allowing the disused sewer to remain in Grange Road, where the disastrous gas explosion occurred on Dec. 30, and for an order to compel the London County Council to fill up or remove the sewer.

The Borough Council were desirous of obtaining undertakings from the London County Council, the Metropolitan Water Board, and the South Metropolitan Gas Company that whatever body was found liable for the damage would repay the Borough Council the cost of reinstating the road. The London County Council have replied that the action which had been commenced by the Borough Council against the London County Council, the Metropolitan Water Board, and the South Metropolitan Gas Company is for the purpose of obtaining a decision upon the question as to whether all or any of the defendants to the action were liable for the damage caused by the explosion, of course, including damage to the road; and if any of the defendants should be held liable, they would have to pay any sum found to be payable by them in respect thereof. The County Council did not, therefore, see that there was any necessity for the undertaking suggested. The Metropolitan Water Board said the matter had been considered by their Law and Parliamentary Committee, who were not prepared to give the undertaking. The South Metropolitan Gas Company also stated that they did not propose to give any undertaking such as was suggested.

The specifications for the repair of the road, prepared by the Borough Surveyor, had been sent to the three interested parties for their observations and approval, and in each case have been returned. They were returned by the London County Council "without prejudice," and with an intimation that, as the tender for the works was to be a lump sum, it would be impossible to differentiate between the cost of the various works. The Metropolitan Water Board said they did not feel called upon to consider the specifications. The South Metropolitan Gas Company replied that they were not prepared to accept any responsibility. The Company, however, pointed out that they had looked at the specifications, and, without mentioning any other item, found that they included the filling up of the old sewer, the cost of which could not under any circumstances be thrown upon the Company or the Metropolitan Water Board.

In view of these replies, the Council have called in Sir Douglas Fox to go through the specifications, with a view of confirming them or otherwise.

## PUBLIC LIGHTING OF HAMMERSMITH.

### Gas v. Electricity.

At the Meeting of the Hammersmith Borough Council last Wednesday, the Electricity and Lighting Committee reported that they had received a letter from the Gaslight and Coke Company to the effect that they would be prepared, if given a contract for five years, to quote an inclusive price of £1 4s. 6d. per lamp per annum for the lighting, extinguishing, cleaning, &c., of the whole of the gas-lamps in the borough at present supplied by them; this being an average reduction of 9s. 2d. per lamp per annum, or a total reduction of about £77. It was explained that the offer was only made subject to the condition that none of the lamps should be converted from gas to electricity. The Committee recommended that, as the conversion of some of the public lamps in Latimer Road and the neighbourhood was already in hand, the proposal should not be entertained. They had also received a letter from the Brentford Gas Company stating that they would be willing to reduce the charge for the future supply of gas to the public lamps in the borough by 2½d. per 1000 cubic feet, making the price 6½d. below the standard price to other consumers; and in the event of a reduction being made in the price to ordinary consumers, a still further reduction would be granted. The offer, however, was subject to the Council entering into an agreement to take a supply of gas for not less than 1000 public lamps for a period of five years. The Committee stated in regard to this proposal that upon the completion of the conversion scheme there would be about 1000 gas-lamps in the borough still supplied by the Company, and the proposal would mean an estimated reduction of £132 8s. 9d. in the annual cost of these lamps. On the other hand, an agreement as suggested would have the effect of preventing any further conversion for five years; and for this reason the Committee recommended that the proposal be not accepted.

Mr. A. Pascall moved, as an amendment, that the report be referred to the Works Committee. On being informed, however, that it could not be dealt with by them, he substituted the Finance Committee. He said that from the commencement of the electricity undertaking he had been of opinion that the street lighting of the borough should not be in the hands of the Electricity and Lighting Committee. They were the providers of the electric light, and he suggested that they were forcing a particular kind of light on the public, quite irrespective of the question of cost. They did not take the steps that would have been taken by any other Committee; they did not even negotiate with the Gas Companies to ascertain the most advantageous terms they would offer. Mr. E. C. Rawlings (the ex-Mayor) seconded the amendment. Mr. Levy asked why the Committee did not, before they entered upon an electric lighting scheme, approach the Gas Company and negotiate for the lowest terms. Mr. Mayle considered it was "ungraceful" for the Company not to have come forward with their offer of reduction before they knew arrangements were being made to change from gas lighting to electricity. As to the question of cost, the Council must remember that the money paid to the Committee for lighting by electricity would come back into the ratepayers' own pockets. The Committee thought they would get a better light by converting the gas-lamps to electric lamps; and they were instructed by the Council to do so. Mr. Burns (the Chairman of the Finance Committee) supported the amendment. He said the Gaslight and Coke Company offered the Council a reduction of 9s. 2d. per lamp per annum, and the Brentford Company should be asked to do the lighting at the same price. The ratepayers were quite satisfied with the present lighting; and he thought the Council ought to save the money. There was no need to rush the matter through, and it should be referred to the Finance Committee for consideration by them in the light of these new offers. Mr. Cracknell (the Chairman of the Electricity and Lighting Committee) quite agreed that the Committee ought not to have charge of the public lighting; and he would support any alteration of the bye-laws to this effect. But he disagreed with the contention that their policy in adopting the electric light was wrong. Let them take the offer of the Gaslight and Coke Company. After the reduction of 9s. 2d. per lamp per annum, the amount would be £2 18s.; and the Council would be bound to keep to gas lighting. The lamps under the electric scheme would cost them £3 0s. 1d. per annum; but at the end of ten years the expense would only be £2 8s. 8d. This would be cheaper than any other lighting in London. As had been said, the Companies only came forward with their offer after the Committee had taken the matter in hand. If he were the Gas Companies, he would come forward and offer to do the lighting for nothing, in order to stop the Council competing with them by electric lighting. It had been stated that the ratepayers were satisfied with gas light. But the Town Clerk had had a petition from 114 people in one road asking for better illumination; and there had been other complaints. The amendment was then put and lost by 16 votes to 13; and the Committee's recommendations were confirmed.

## LONDON COUNTY COUNCIL AND ASSESSMENT.

### Assessment of Metropolitan Water-Works.

At the Meeting of the London County Council last Tuesday, the Local Government, Records, and Museums Committee (No. 1) presented the following report on the subject of the assessment of the undertaking of the Metropolitan Water Board.

We have had under consideration the assessment of the undertaking of the Metropolitan Water Board; and the appeals by the Board against assessments in various parishes having recently been decided, it is now possible to estimate the effect upon rating of the transfer of the undertaking from the Water Companies to the Board.

The transfer of the undertaking took place in June, 1904, and at the quinquennial valuation in 1905 the Metropolitan Water Board contended that the undertaking should be valued as a whole, and the rateable value of the directly productive portion—*i.e.*, the distributing mains and services—should be apportioned among the several parishes on the basis of the gross revenue in each parish, subject to allowance being made for variations in local rates. Four of the London Assessment Committees—viz., those of the City of London, the Greenwich and Woolwich Unions, and the Metropolitan Borough of Islington—declined to agree to this proposal, taking the view that the undertaking should be valued in sections, or that the rateable value of the directly productive works should be apportioned on the basis of net earnings. In the proceedings which followed, the Court of Quarter Sessions adopted the principle contended for by the Board; and this decision was subsequently upheld by the High Court, but rather owing to the absence of any other practical method of valuation being suggested.

The full effect of the decision will not be appreciated until the next quinquennial revaluation; but, comparing the total rateable value of the undertaking before and after the last revaluation, there has been an increase in the case of the Administrative County of £15,205—*i.e.*, from £620,328 to £635,533. In the City and the Metropolitan Boroughs there have been decreases in eight cases, aggregating £35,808; and in twenty-one cases there have been increases, aggregating £51,013. The total rateable value (£635,533) represents an increase of £10,306 over the total rateable value of the Companies' undertakings in London at the quinquennial valuation in 1900; whereas during the quinquennium of 1895-1900 there was an increase of £95,398. On the assumption that the latter increase was normal, and was roughly proportionate to the mean increase of the population and total rateable value during the same period, the corresponding increase in the rateable value of the undertaking during the quinquennium of 1900-1905, had there been no transfer, would have been about £108,000, or nearly £98,000 in excess of the increase which actually took place.

We think there can be little doubt that, under existing conditions, the extra-county districts within the limits of supply are gaining at the expense of London. The adoption of the principle laid down by the Courts does not affect the total valuation of the Metropolitan Water Board's undertaking, but only the apportionment of the valuation among the several districts. It may be assumed that in the sparsely populated extra-county districts, where rateable values of properties are comparatively low, working expenses are higher in proportion to revenue than in the compact central districts where high rateable values obtain. The adoption, therefore, of the basis of gross revenue, instead of net earnings, results in preferential treatment of the extra-county districts.

We are of opinion that the Council should endeavour to obtain the removal of this injustice to London. It may be urged that the Board are bound by the decision of the Court. But we would point out that, in announcing the decision of Quarter Sessions, the Deputy-Chairman stated that the respondents had not placed before the Court any other practical method of valuation; and the decision of the High Court was, as already mentioned, also arrived at on the same grounds. We feel that it would be possible to formulate a scheme whereby the total rateable value of the Board's undertakings could be more equitably apportioned, and we therefore recommend—(*a*) That in the opinion of the Council the method of arriving at the rateable value of the undertaking of the Metropolitan Water Board in the various parishes within the limits of supply is inequitable to London, and that a more equitable apportionment of the total rateable value of the undertaking as between

the Administrative County of London and the extra-county districts, should be adopted. (*b*) That the foregoing resolution be communicated to the Metropolitan Water Board, and to the London representatives thereon.

### Conference on Valuation and Assessment.

The same Committee presented a report on the conference on valuation and assessment. It set forth that on the 1st of December last the Council decided to convene a conference with representatives of the City Corporation, the Metropolitan Borough Councils, the London Assessment Committees, the Metropolitan Asylums Board, the Metropolitan Water Board, and the Receiver of the Metropolitan Police District, to consider questions of assessment procedure and practice in connection with the quinquennial valuation of property in London in the year 1910, and also matters relating to the amendment of the valuation law. The conference was held on 19th and 26th of February, and all the authorities were represented except the Receiver of Police. The conference resolved—"That, pending legislation, it is desirable that the Council should exercise such powers as it may possess under the Valuation (Metropolis) Act, 1869, with a view to securing a fair valuation to common charges of every parish included within the Administrative County of London." The Committee suggested that this resolution should be referred to them; and they said they would take the necessary steps to communicate with the Government departments and authorities concerned in certain resolutions of the conference. The recommendations were agreed to.

## WORK AND WAGES AT THE LIMERICK GAS-WORKS.

### Report by Mr. Henry Hawkins.

As briefly mentioned in the "JOURNAL" last week, the Gas Engineer and Manager of the Limerick Corporation has lately presented to the Gas Committee a report on the working of the undertaking during the time he has been in office; his object being to rebut certain statements which had been circulated in the city.

Mr. Hawkins first enumerated the items of expenditure on plant, which amounted to £5886, compared with £13,000 which the Chairman of the Gas Committee stated he had been informed had been laid out on the works; and it was explained that the lower sum included not only renewals and extensions at the works, but also mains and public lamps. Turning to the carbonizing department, Mr. Hawkins produced figures showing that while the gas made in the year ended March 31, 1905, was 107,008,000 cubic feet, and the total wages paid £1959 15s. 3d., in the last financial year the figures were 104,667,000 cubic feet and £2478 8s. 7d. Consequently, with a smaller make of gas by 2,341,000 cubic feet, the retort-house wages had increased by £518 13s. 4d. The cost per 1000 cubic feet for stokers and coal wheelers in 1905 was 4·395d.; and in 1908, 5·608d. In Dublin, Belfast, Cork, and Londonderry, the average is 3·432d. The average production of gas per retort from April 1, 1908, to the 12th ult. was 6504 cubic feet. About eighteen months ago the workmen applied for the adoption of the terms and conditions in force at the Cork Gas-Works; and these were granted. Up to that time, the pay was as follows: Stokers' wages (for an 8-hour shift), 4s. 6d.; coal wheelers' (for a 12-hour shift), 3s.—the bulk of coal handled being in each case unknown. The Cork terms were: Stokers' wages, 5s. 2d.; coal carbonized, 50 cwt.; shift, 12 hours. Coal wheelers' wages, 3s. 7d.; coal weighed and wheeled, 10 tons; shift, 12 hours. The men practically agreed to accept the Cork terms; and the stokers' wages were advanced to 4s. 10d. and the coal wheelers' to 3s. 7d. The Gas Committee, in order to prevent dissatisfaction, spent £56 in providing four 5-cwt. weighing machines in the retort-house; but the conditions accepted had not been adhered to. The stokers carbonized only 2 tons of coal in the 8-hour shift; and the wheelers dealt with only 5 tons in 12 hours. Moreover, Mr. Hawkins informed the Committee that it was a common practice for a number of men to absent themselves from work at week-ends, especially on Saturday morning, when from 10 to 15 of them would stay away till ten o'clock. He pointed out that no engineer could carry on the works successfully under such conditions. He asked—and he said he had a right to expect it—that the workmen should unite with him in doing what was right and just to the Committee and all concerned; for where unity existed, success was bound to follow. In conclusion, he assured the Committee that he had no desire to reduce labour but to increase it; and it was only by the success of the undertaking that this could be accomplished. He therefore trusted that the workmen would join with him in promoting a kindly feeling throughout the department, and would thereby further its interests.

**Prescot Gas Company.**—The annual general meeting of this Company was held on the 25th ult.—Mr. Henry Cross (the Chairman) presiding. It was reported that the quantity of gas made during the past year was 46,800,000 cubic feet, and that the gas sold showed an increase of 5½ per cent. Though the price of gas was reduced by 1d. per 1000 cubic feet last year, there was an increase of £235 in the gas-rental, as well as in the amount received for coke and sulphate of ammonia, but a decrease in the tar account. The profit for the year was £1830; and the amount to be carried forward, after paying dividends, £2339, against £2010 this time last year. The Chairman intimated that the price of gas would be reduced by 2d. per 1000 cubic feet for lighting and power purposes, and that there would be a further reduction of 4d. per 1000 cubic feet for gas used for gas-fires; the alterations to take place as from the 1st inst. A vote of thanks was accorded to the Chairman for presiding, and to the Manager and Secretary (Mr. John E. Hall) and the whole of the staff.


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## GAS APPARATUS SUPPLY COMPANIES.

The seventh ordinary general meeting of the New Inverted Incandescent Gas-Lamp Company, Limited, was held on Monday last week—Mr. J. T. Saunders in the chair. The Secretary (Mr. E. C. C. Smith) having read the notice convening the meeting, the Chairman moved the adoption of the report, some figures from which were given last week. He first congratulated the proprietors on the result of the past year's trading, especially as the commerce of the country had gone through a period of great depression. In addition to being able to recommend a dividend at the same rate as last year—viz., 6¼ per cent.—the Directors had written off the patents account the sum of £1000, making the amount so written off £17,500. They now proposed to add to the reserve fund £1000, making this up to £7500, and to carry forward £1477—an amount which he was happy to say was slightly in excess of that carried forward last year. During the twelve months they had moved into new show-rooms and offices, and were now able to display goods to very much better advantage. He thought they might fairly claim to have the finest show-rooms and the finest selection of burners, fittings, and accessories in the inverted lighting trade. They owed it largely to the tact and energy of their Managing-Director, Mr. James Bridger, that they had been able so well to hold their own in face of the enormous competition prevailing. Mr. H. Woodall seconded the motion; and it was carried unanimously. The dividend recommended was declared. A motion to increase the remuneration of the Directors was proposed; but, at their request, it was withdrawn.

Mr. J. F. Wright presided at the fifth ordinary general meeting of the Sutherland Meter Company last Wednesday, and moved the adoption of the report and accounts, which were noticed in the "JOURNAL" last week (p. 930). He said it would be remembered that at the last general meeting he held out very slight hopes of any great increase in profits for the then ensuing year. He regretted to say the opinion he formed had been verified. The general trade of the country during 1908 had been deplorably bad—worse, he thought, than he had known it during his forty years' business experience. The bulk of their trade was done in penny-in-the-slot meters, which were bought by gas companies for use in artizans' dwellings. When depression in trade came, fewer artizans' dwellings were erected, and fewer slot-meters were required. This had been the case during the past year. He believed, however, they had more than held their own against their competitors, who had also suffered from this cause. No stone had been left unturned to deal with business where it was to be done; and he could assure the shareholders it was not through want of care, attention, or thought on the part of the Directors, or of hard work on the part of the officials, that the result for the year was not better. Though prices had been better, and had been advancing over the level of 1907, yet during the past year they had had contracts running out at old prices. These, he was glad to say, were practically at an end; and on every meter they were now selling they were getting a fair profit. Another matter which had seriously affected their profits had been the difficulties occasioned by the severance of the tie which had hitherto existed between Messrs. John Wright and Co. and the Sutherland Meter Company. During 1908 they had been in a state of transition; and it had necessitated their opening temporary works in London. He looked forward to the future with hope. Trade might improve; and, if it did, they were in a better position than ever before for taking advantage of it, and making a profit. Mr. G. E. Wright seconded the motion, which was agreed to.

## NOTES FROM SCOTLAND.

**From Our Own Correspondent.**

*Saturday.*

The Provisional Order of the Musselburgh Gas Company, which yesterday received the approval of a Parliamentary Commission sitting in Edinburgh, raises no new question in gas supply, and probably for this reason it was, in effect, unopposed. It occupied the attention of the Commissioners for only a few minutes. It was, however, preceded by an inquiry into an application by the Corporation of Musselburgh for an extension of the burgh boundaries, which ran into the fourth day. In explanation of the prolonged nature of the inquiry into the boundary question, it may be mentioned that the town of Musselburgh is built upon the Lothian coalfield, which, though it has been worked for over 300 years, is yet in reality only in the infancy of its development; and the county of Midlothian were loth to lose a part of their area which they regarded as certain to yield, in the future, a larger return in assessments. The Town Council's plea was that they had no land upon which they could meet the demand for housing for a prospective increase in the population, and that they therefore required to take in unbuilt-on lands in the vicinity. The Parliamentary Commissioners granted the Corporation their Order. The same reasons which moved the Corporation applied to the application of the Gas Company. Their authorized capital has been expended, and their borrowing powers exhausted; and if the town is to be enlarged in area, and to increase in population, it was necessary that they should extend their works, so that they might be able to meet prospective demands upon them. When they were making the application, they went further, and have asked that, in accordance with the trend of present-day legislation, they should be allowed to reduce the illuminating power of the gas. The Musselburgh Gas Light Company is at the present moment one of five companies in Scotland who possess parliamentary powers. The Company are obliged to supply gas of 22 candles illuminating power; and they are really supplying 24-candle gas. Under the Order they are to be allowed to reduce the power to 14 candles. The Company have been working under a sliding-scale, in which the standard price of gas has been 3s. 9d. per 1000 cubic feet; and this standard price is

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retained. That the testing of the illuminating power of the gas has been changed to a test by the "Metropolitan" argand No. 2 burner does not seem to have aroused any interest in Musselburgh; and the new condition was authorized without opposition. It is to be observed that the word "Light" has been dropped out of the title, which is a sensible thing to do, seeing that the Company intend to offer gas for cooking, heating, and motive power, as well as for lighting purposes, in the town.

I regret exceedingly having to record the death of Mr. G. Malam, the Gas Engineer and Manager at Dumfries. [An obituary notice appears in another part of the "JOURNAL."]

A decision was given in the High Court of Justiciary in Edinburgh on the 17th ult., which, inasmuch as it related to the sale of coal, cannot fail to be of interest to gas managers. Messrs. J. & P. Coats, Limited, thread manufacturers, of Paisley, in January, 1908, purchased 479 tons of Best Bent splint coal, at the price of £336, from David Brown, of Glasgow. The coal was shipped to Barcelona; and a certificate was granted by Brown to the effect that the coal was as contracted for. It was averred by Messrs. Coats, on the other hand, that only 30 tons were Best Bent splint. They reported the matter to the criminal authorities, who in Scotland are the prosecutors in all criminal matters. The authorities refused to prosecute; the Lord Advocate being of opinion that Messrs. Coats had a civil claim. He stated his willingness, however, to reconsider the matter after the issue of any civil proceedings which might be taken. But instead of instituting these proceedings, Messrs. Coats petitioned the High Court for permission to personally conduct a criminal prosecution. Such an application had not been made to the Court for very many years; and on account of the unusual nature of the case, and the importance of the question involved, a bench of six Judges were appointed to hear the arguments. The Special Court, with one dissentient (Lord M'Laren) granted the permission asked; and the trial of Brown has been fixed for the 24th of May. Should a conviction follow, a new power will have been put into the hands of the purchasers of coal.

In 1885, the Corporation of Glasgow obtained an Act of Parliament empowering them to raise the level of Loch Arklet, near Loch Katrine, for the provision of an augmentation to the water supply. The district is the property of the Duke of Montrose; and for the settlement of any questions which might arise between His Grace and the Corporation, it was agreed that Mr. J. H. Dickson, of Liberton, Edinburgh, should be sole Arbiter. A claim was made by the Duke for £26,500 compensation, upon which the Arbiter heard evidence in July. He has now issued his final award, fixing the compensation, in respect of land taken, damage to farms through their decreased letting value, damage to shootings and fishings, &c., at £19,090. The level of the loch is to be raised 22 feet, and its area enlarged from 207 to 561 acres. The addition to the city water supply will be equal to 10 million gallons per day. In accepting the award, some hard observations were made regarding the unsatisfactory results that had been secured, and the costs, of arbitrations generally.

## CURRENT SALES OF GAS PRODUCTS.

**Sulphate of Ammonia.**

LIVERPOOL, *April* 3.

With the covering of March requirements, demand slackened; and towards the close the trend of the market has been rather in favour of buyers, though in some cases full prices have been reported. Home demand has been fairly well sustained, and stocks have nowhere been allowed to accumulate in the hands of makers. The closing quotations are £11 10s. per ton f.o.b. Hull, £11 12s. 6d. f.o.b. per ton Liverpool, and £11 15s. per ton f.o.b. Leith. There has not been much interest in the forward position; makers still holding out for £11 15s. per ton f.o.b. best ports, and buyers being unwilling to pay this price. Speculative sales, however, are reported from abroad, but prices accepted have not transpired.

**Nitrate of Soda.**

Although negotiations for reconstituting the Combination of Producers have broken down, and though actual demand for prompt and near delivery has been slow, holders of cargoes near at hand have stiffened their ideas as to prices. On spot, too, sellers are very firm at 10s. 4½d. and 10s. 7½d. per cwt. for 95 per cent. and refined qualities respectively.

**Tar Products.**

LONDON, *April* 5.

Markets have been steady throughout the past week, and values have been well maintained all round. For pitch there is a large inquiry, and prices have hardened up. Creosote is steady, and makers firm in their ideas. Benzols are still very depressed, and makers find it very difficult indeed to sell. Solvent naphtha is quiet, and cheap sales are reported in the north; while in London the manufacturers are feeling the effects of the cheaper country makes which are being offered. Carbolic is steady, and several parcels of 60's have been sold at rather better figures. Crystals are somewhat heavy; manufacturers finding it difficult to place any large quantities. Crude naphtha from coke-ovens is fetching very low prices, owing to the depressed state of benzol. Many qualities are not fetching the price of creosote.

The average values during the week were: Tar, 13s. 3d. to 17s. 3d, *ex* works. Pitch, London, 23s. to 23s. 6d.; east coast, 22s. 6d. to 23s.; west coast, 22s. to 23s. f.a.s. Mersey ports, 21s. 6d. to 22s. others. Benzol, 90 per cent., casks included, North, 5¼d. to 5½d.; London, 5¾d. to 6d.; 50-90 per cent., casks included, North, 6d.; London, 6¼d. Toluol, casks included, North, 8d. to 8½d.; London, 8¾d. to 9d. Crude naphtha, in bulk, North, 3d. to 3¼d.; London, 3¼d. to 3½d.; solvent naphtha, casks included, North, 9d. to 10d.; London, 10½d. to 11d.; heavy naphtha, casks included, North, 10d. to 10¼d.; London, 11d. to 11¼d. Creosote, in bulk, London, 2¾d. to 2⅞d.; North, 2½d. to 2⅝d. Heavy oils, in bulk, 2 15/16d. to 3d. Carbolic acid, 60 per cent., casks included, east coast, 1s. to 1s. 0½d.; west coast, 11½d. to 1s. Naphthalene, £4 10s. to £8 10s.; salts, 37s. 6d., packages

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**Sulphate of Ammonia.**

The market has been steady but quiet; and the Beckton price is £11 17s. 6d. Other makes upon Beckton terms are £11 10s., and ordinary London £11 8s. 9d. In Hull, the price is £11 10s.; and in Liverpool, £11 12s. 6d. In Leith, the value is £11 15s.

## COAL TRADE REPORTS.

**Northern Coal Trade.**

There has been a continued activity in the coal trade; and the demand for best steams has been relatively heavy. The output is full at present; but the collieries seem to be pressed with orders, and the prices vary according to the time of delivery. Best Northumbrian steams are quoted from 11s. 9d. to 12s. 6d., according to time of delivery, second-class steams are from 9s. 6d. to 10s. 6d., and steam smalls are from about 5s. to 6s. In the gas coal trade, the demand is steady for the season, but is less than it was, and will still fall. Durham gas coals are quoted from about 9s. to 10s. per ton f.o.b., with about 6d. higher price for the best "Wear Specials." More contracts have been settled; and the heaviest, local and southern, are now decided—practically on the basis of 8s. 6d. to 9s. per ton f.o.b., according to quality. There have also been sales of some lots of gas coals at 9s. 9d. for best and 9s. for seconds over the year; and the present tendency of the market seems to be firmer—perhaps because the large contracts named have taken a good deal of coal out of the market. Coke is very generally quiet. Gas coke is much less plentiful, and is quoted at from about 12s. 9d. to 13s. 3d. per ton f.o.b. in the Tyne, with a steady inquiry for good quality for export.

**Scotch Coal Trade.**

The market is quiet, particularly in the West, where the demand for shipping is very restricted. Ell is in very poor request; and so is splint. In the East, the shipping demand is much stronger, and the tone firmer. The prices quoted are: Ell 8s. 6d. to 9s. 9d., splint 9s. 6d. to 9s. 9d., and steam 9s. to 9s. 3d. per ton f.o.b. Glasgow. The shipments for the week amounted to 287,161 tons—an increase of 35,484 tons on the previous week, and of 38,790 tons on the corresponding week of last year. For the year to date, the total shipments have been 2,929,720 tons—an increase of 243,258 tons upon the corresponding period.

**Kingsclere Gas Company to be Wound Up.**—At an adjourned meeting of the shareholders of the Kingsclere Gas and Coke Company, held recently at the Secretary's Office, the Chairman (Mr. W. J. Prior) proposed, and it was carried unanimously, "that the Company be wound up, and that a Liquidator be at once appointed."

**Reduction in Price at Wokingham.**—The Wokingham Town Council are reducing the price of gas from 4s. 2d. to 3s. 9d. per 1000 cubic feet. They have also agreed to supply through slot-meters 18 cubic feet for 1d., and to return to the consumers each quarter a bonus of 1d. in the shilling collected from these meters.

**The Universal Gas Methane and Buisson Helia Company, Limited.**—The first ordinary general meeting of the Company was fixed to take place at the offices in Cheapside yesterday (Monday) afternoon. Our representative, however, on applying for admission, was informed that "a report would be sent on." We regret, therefore, that we are unable to publish an account of the proceedings.

**Briton Ferry Gas Manager Congratulated.**—At the last meeting of the Briton Ferry Urban District Council, the Gas Manager (Mr. J. Mogford) was unanimously thanked for having produced a very favourable balance-sheet of the undertaking. The proposer said there had for years been a large annual loss on the works; but under Mr. Mogford's management things had gradually improved until there was a credit balance of £64.

**New Joint-Stock Companies.**—The Incandescent Manchon Gaulois, Limited, has been registered with a capital of £40,000, in £1 shares, to carry on in France, Great Britain, and elsewhere the business of manufacturers, sellers, and exporters of incandescent gas-mantles and ancillary products. The Selas Lighting Company, Limited, has been registered with a capital of £60,000, in £1 shares, to adopt an agreement, and carry on the business of manufacturers, suppliers, installers, and repairers of incandescent lights, &c. The Wem Gaslight and Coke Company, Limited, has been registered with a capital of £10,000, in £5 shares.

**Dartmouth Gas Company.**—The report presented at the annual meeting of the Dartmouth Gas Company, Limited, yesterday week, showed that the receipts had been £4835, or £146 more than in the previous year, and that the profit on the twelve months' working was £628. It was decided to pay a dividend of 9s. per share on the ordinary shares. The number of prepayment meters has increased by 115 during the past year, and is now 705. A new gasholder and tank have been erected; and a washer and scrubber and other plant are being installed. To meet the cost of these extensions, 700 new 5 per cent. preference shares of £2 each have been issued.

**Proposed Water-Works for Ruddington.**—A Local Government Board inquiry was held last week at Ruddington, by Dr. A. W. Brightmore, into an application by the Basford Rural District Council for sanction to borrow £4000 for the construction of proposed water-works for the parish. Mr. S. Maylan, the Engineer and Surveyor to the Council, in a report on the subject, stated that the Nottingham Corporation had agreed to lay a 9-inch main from their reservoir on Wilford Hill to the boundary of Ruddington, and to supply water to the Basford Council at 1s. per 1000 gallons. Ample provision had been made for all reasonable development of the district.

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**The Glamorgan Water Board and the Pontypridd Water-Works.**—According to the "Western Mail," terms have been practically agreed upon by which the Glamorgan Water Board, for the constitution of which a Bill is now before Parliament, will acquire the undertaking of the Pontypridd Water Company, including the Ystradfellte scheme for which the Company obtained parliamentary sanction last session. The Company is one of some years' standing, having been incorporated in 1864, with a capital outlay of about a quarter-of-a-million sterling. They have now a reservoir under construction.

**Lighting of Ascot Main Roads.**—The main roads of Ascot have for some time past been lighted by gas, by public subscription. Last Wednesday evening, a parish meeting was held, when a resolution was moved that the Parish Council be empowered to adopt the Lighting and Watching Act, in order that the lighting of the district might become general, and the cost defrayed out of the rates. When a vote was taken, 13 supported the motion and more than 70 opposed it. A rate of 1½d. in the pound would have been sufficient for the lighting scheme and have left a balance. It was announced by the Chairman that many of the subscribers would not continue their support of the present system.

**Reported Discovery of Coal in Essex.**—While sinking a well at Roxwell, near Chelmsford, a few days ago, workmen came upon a seam of what was thought to be coal, at a depth of 380 feet from the surface. "The Times" says that no importance is attached by geologists to the discovery, as in order to reach the coal measures in Essex—even supposing them to run through the county—it would be necessary to get through not only the London clay but also the chalk. If coal exists in Essex, it is at a depth of at least 2000 or 3000 feet. It is probable that what the well diggers came upon was a small quantity of carbonaceous matter which might by courtesy be called coal; but its presence there would not indicate the appearance of the coal measures, and could not be spoken of as a discovery of coal. Such carbonaceous matter was found at Croydon some years ago when a railway was being made there; and it occurs also at Bovey Tracey and other places.

**Hammersmith Borough Council and Gas Testing.**—At the meeting of the Hammersmith Borough Council last Wednesday, the Law and Parliamentary Committee reported that they had considered a letter from the Hon. Secretary of the Gas Conference of the Acton, Chiswick, Hanwell, and Twickenham Councils, reviewing the proceedings taken against the Brentford Gas Company early in the year for alleged deficiency in illuminating power, and stating that it was proposed to ask the Board of Trade to receive a deputation on the subject of the test-burner, such deputation to include, in addition to the Councils within the area of the Brentford Company, other Councils whose supply of gas by companies is furnished on similar conditions; and the conference wished to know whether the Hammersmith Council would be willing to appoint representatives. The Committee recommended that no action should be taken on the letter; and this course was agreed to without discussion. The Public Analyst reported that, acting on the instructions of the Council, he had, on the 24th of February, made a photometric test at the Town Hall of the gas supplied by the Brentford Company, with the result that the illuminating power was found to be equal to 14·51 candles (being 0·51 candle above the statutory requirement), and that the pressure was satisfactory. Instructions were given for certain persons who had complained of the gas to be informed of the result of the test.

**Herne Bay Gas and Coke Company, Limited.**—At the recent ordinary general meeting of this Company, the accounts presented for the year ended Dec. 31 showed that the revenue amounted to £13,652, and the expenditure to £9963; leaving a balance of £3699. The profit available for distribution (after payment of the interim dividends) was £2398; and the Directors recommended the payment of dividends making with those already paid 10 and 7 per cent. per annum. These would absorb £1602, and leave £796 to be carried forward. The Directors reported that the sale of gas showed an increase of more than 4½ per cent. compared with the year 1907. The Chairman (Mr. W. A. Surridge), in the course of his remarks when moving the adoption of the report, pointed out that the capital account was steadily working downwards, having been reduced from £800 not long ago to £666 now per million cubic feet. He also stated that the carbonizing results, owing to the watchful care of the Manager (Mr. C. V. Bennett) continued on a very high plane; the yield of gas per ton of coal having been 11,099 cubic feet. Mr. W. Benson having seconded the motion, the Auditor (Mr. E. L. Burton) congratulated the Board upon the very successful result of the year's working, and particularly upon the two features mentioned by the Chairman, which he considered most satisfactory. The report was adopted; and the dividends recommended were declared.

**Relic of the Early Days of Gas Lighting in Exeter.**—A local correspondent writes as follows: The Exeter Gas Company was incorporated by Act of Parliament in 1815; but it was two years later when the city was lighted by gas. During the past few days there has come to light a mutilated slip of parchment, which was discovered in an old book picked up at a second-hand book shop. It is a kind of palimpsest, except that the newer and less-valuable "copy" is written on the back instead of being erased and written over. The parchment contains the information that in the year 1814 a Mr. Phillips, son of Mr. Alderman Phillips, of Fore Street, delivered a course of twelve chemical lectures in Exeter. Those who attended them were so satisfied that they gave Mr. Phillips a table air-pump with subsidiary apparatus. Then follows the statement: "Early in the year 1815, be lighted his father's shop in Fore Street, Exeter, with gas. This was the first illumination by gas that was seen in Exeter." A newspaper paragraph, dated April 10, 1815, thus notices the new illumination: "Mr. Alderman Phillips's shop in the Fore Street, Exeter, has for some weeks past been lighted with gas by the skill and science of Mr. Reuben Phillips, the Alderman's eldest son, whose first course of philosophical lectures and experiments, delivered last winter to select companies of his friends, was so much admired. These gas-lights were of extraordinary beauty and brilliance, and would in a few years produce a great saving if generally adopted throughout the city."


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***and Box No. 4 (G.P.O.) Dunedin.***

**Sales of Shares and Stock.**—At a recent sale by Mr. Isaac Rice, some £5 "C" shares in the Tonbridge Water-Works Company, Limited, fetched £7 12s. 6d. and £7 13s. each. At the Auction Mart, Kettering, on the 26th ult., Mr. M. C. Wilson sold some "C" stock of the Kettering Gas Company at £123 per £100, and £25 of "A" stock for £66 10s.

**The New Reservoir at Honor Oak.**—The Lord Mayor, who will be accompanied by the Lady Mayoress, will formally open, on the 5th prox., the new covered reservoir which the Metropolitan Water Board have constructed at Honor Oak. The reservoir, which has taken three years to build, was designed by Mr. J. W. Restler, the Deputy Chief Engineer to the Board, and formerly Engineer of the Southwark and Vauxhall Water Company. It occupies a site by the side of Peckham Rye, and is capable of holding 56½ million gallons of water, or a day's allowance for 1¾ million people—a quarter of the total population supplied by the Board. It is stated that the new reservoir is the largest covered reservoir ever constructed at one time. The roof is built on arches supported by brick piers; and the reservoir has a depth of from 21½ to 34 feet.

**Application by Birkenhead for a Provisional Order.**—On Friday, a special meeting of the Birkenhead Town Council was held to pass a resolution directing application to be made to the Local Government Board for a Provisional Order under the Public Health Act, 1875, to enable the Corporation to utilize certain lands for the purposes of the gas undertaking. Mr. Dodds raised a question as to the amount that was to be borrowed for the extensions; contending that the Gas Committee should as far as possible use any surplus they had in hand, so as to obviate the borrowing of a larger sum than was absolutely necessary. The Mayor, however, pointed out that they were not then discussing the question of expenditure; the present application was merely for power to use the land for the purposes mentioned. The members might, he said, be quite sure that, when the inquiry came on, if the Council could take anything out of surplus revenue, it would be done to as great an extent as was wise in the circumstances. The resolution was carried unanimously.

**Gas and Electric Street Lighting at Handsworth.**—In reply to an inquiry in the correspondence columns of the "Birmingham Daily Post" as to the relative cost of electric and street gas lighting, Mr. A. Mills writes as follows: There are in Handsworth considerably over 200 miles of roads lighted by the Council, of which some 5 miles, having 120 lamps, are at times lighted by electricity (after 11 o'clock p.m., the darkness merely has the chill taken off it by the same means), while the remaining 195 miles (say) are gas lighted, and would have, on the same basis of 24 per mile, a total of 4680 lamps. In the published report of the Finance Committee's estimates for the ensuing year to be submitted to the Council, it was stated there would be required for street lighting by gas the sum of £2200, and for street lighting by electricity £1488. Now, based upon these figures, the relation of cost as between the two forms of lighting works out as follows: Electric, cost per mile, £297, cost per lamp £12 8s. Gas cost per mile £11 5s. 8d., cost per lamp 9s. 5d. Exact figures as to length of roads and number of gas-lamps would make the disparity between the two kinds of illumination even wider. In face of such wanton extravagance as here shown, what may not the ratepayers expect when, if ever, the Council receive their mandate to apply for incorporation? The penny just taken off the district rate would soon be put on again, accompanied by a swarm of brothers.

## APPLICATIONS FOR LETTERS PATENT.

6729.—Welch, W. H. I., "Incandescent gas-lamps." March 20.
6754.—Anderson, J., "Automatic gas lighting and extinguishing apparatus." March 20.
6811.—Cowper-Coles, S. O., "Bricks and tiles for heating purposes." March 22.
6892.—Dorrington, A. A., Hitchon, F., and Heap, H., "Generating air gas." March 23.
6899.—Doxey, A. S., Dudley, S., and Birch, G., "Stands for gas utensils." March 23.
6909.—Fletcher, Russell, and Co., Ltd., Neil, A., and Fletcher, T. W., "Muffle-furnaces." March 23.
6910.—Fletcher, Russell, and Co., Ltd., Neil, A., and Fletcher, T. W., "Blast-oven furnace." March 23.
6911.—Fletcher, Russell, and Co., Ltd., Neil, A., and Fletcher, T. W., "Regulating the supply of gas in apparatus in which the gas-flame is required to be automatically reduced or increased." March 23.
6928.—Knappich, J., "Welding burners." March 23.
6963.—Deutsche Gasglühlicht Akt.-Ges. (Auerges.), "Attaching mantles to rings." March 23.
6986.—Smith, W. D., and Reader, F. J., "Gas cooking-stoves." March 23.
6997.—Ramassot, M., "Automatic temperature regulator for gas-heaters." March 23.
7028.—Pollock, W. C. & S., "Gas-engines." March 24.
7153.—M'Millan, A., "Anti-vibrators." March 25.
7212.—Stevens, A. G., "Actuating gas-taps simultaneously." March 25.
7272.—Harrison, J., "Lighting and extinguishing gas-lamps." March 26.
7245.—Lewis, J. W., and Banks, W., "Mantle holders." March 26.
7271.—Auld, J., "Reducing valves." March 26.
7305.—Cardell, C. C., "Prepayment meters." March 26.
7333.—Méker, G. A. H., "Gas-burners." March 26.
7384.—Helps, G., "Gas lamps and burners and the lighting and extinguishing of same." March 27.
7399.—Ehrich and Graetz, "Gas-regulators." March 27.
7400.—Gower, J. E. "Production of semi-water gas." March 27.
7427.—Coulson, S. G., "Treatment of tar." March 27.
7434.—Robson, G., "Automatically operating gas-burners." March 27.


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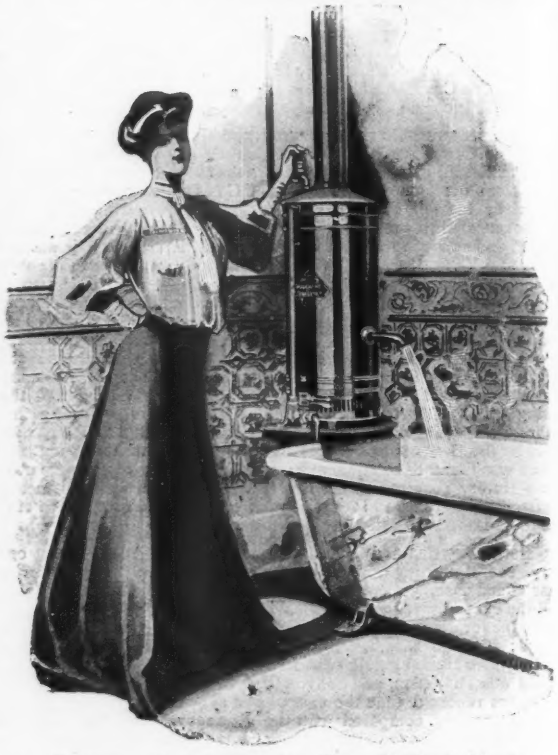

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*A Source of Satisfaction to all.*

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Where all Patterns may be Inspected.

It was stated in the minutes of the Gas Committee submitted at last week's meeting of the Belfast County Borough Council that the Manager (Mr. R. Sharpe) had reported that the Sub-Committee had appointed Mr. John Browne, of Ponder's End, to the position of Gas Engineering Assistant, at a salary of £4 per week; one month' notice on either side to terminate the engagement.

The shipyard co-partnership scheme introduced by Sir Christopher Furness entered upon its twelve months' trial last Wednesday. The employees' shares have been taken up largely; and it is expected that as the two shipyards included in the scheme add to their staffs, the number of shares taken up are, practically speaking, certain to increase proportionately.

Professor Henry Adams, M.Inst.C.E., of No. 60, Queen Victoria Street, E.C., has taken his eldest son, Mr. Henry Charles Adams, Assoc.M.Inst.C.E., into partnership with him in his practice as a consulting engineer and surveyor, under the style of Henry Adams and Son, at the above address. The firm have also an office at 1, Waterloo Street, Birmingham.

During the first week in which the officials of the Consolidated Gas Company of New York were engaged in paying out the "suspense fund," representing the difference of 20 c. per 1000 cubic feet withheld during the time the validity of the 80-cent gas-rate was being determined in the Courts, the sum of $530,664 was returned to consumers. Of the amount thus refunded, the Company paid $392,782, of which approximately 71 per cent. was taken from the Special Master's fund and 29 per cent. was paid direct by them; being collections for overcharge which had not been deposited.

We have received from Mr. E. C. Amos, the British representative of the Swiss Locomotive and Machine Works at Winterthur, their new catalogue of gas engines and producers. The former are designed to be used with ordinary or producer, blast-furnace, or coke-oven gas; and they are made up to 2000 H.P. Those of 25 H.P. and upwards are fitted with improved valve-gear, which it is claimed ensures a perfect mixture at all loads with a minimum consumption of fuel. The catalogue is forwarded from the London Office, No. 3, Laurence Pountney Hill, Cannon Street, E.C.

## WANTED, FOR SALE, CONTRACT, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

### Situations Vacant.

ASSISTANT WORKING FOREMAN. (Stove and Repairing Shop). No. 5077.
ENGINEER-MANAGER. Shipley Gas Department. Applications by April 17.
MANAGER (COKE OVEN AND BYE-PRODUCT PLANT). No 5083.
WORKING MANAGER. Dolgelly Gas-Works. Applications by April 12.
REPRESENTATIVE (IRELAND). The G. J. Eveson Coal and Coke Company, Birmingham.
GAS-FITTER. No. 5082.
GAS-FITTER. Barnstaple Gas Company.

### Situations Wanted.

ARCHITECT, &c. (OR ANY OTHER CAPACITY). No. 5078.
MANAGER. No. 5075.
REPRESENTATIVE (GAS PLANT AND CONSTRUCTIONAL IRONWORK). No. 5084.
SECRETARY, MANAGER OR ACCOUNTANT. Mimmack, St. Paul's Cray, Kent.

### Premises and Land to be Let (London, W.C.).

MESSRS. CALEY AND SON, LIMITED, Chenies Street, W.C.

### Plant, &c. (Second-Hand), for Sale.

PURIFIERS. Hexham Gas Company.

### Gas-Works for Disposal.

KINGSCLERE GAS-WORKS. By Auction. April 20.

### Stocks and Shares.

ASCOT DISTRICT GAS AND ELECTRICITY COMPANY. April 27.
GRAYS AND TILBURY GAS COMPANY. April 27.
SOUTHEND WATER COMPANY. April 27.

### TENDERS FOR

### Benzol (Crude).

BRIDGEWATER COLLIERIES COKE-WORKS. Tenders by April 26.

### Coal and Cannel.

LINCOLN GAS DEPARTMENT. Tenders by April 17.

### Fire-Clay Goods.

EDINBURGH AND LEITH GAS COMMISSIONERS. Tenders by April 12.

### Gasholder and Tank.

CLEATOR MOOR URBAN DISTRICT COUNCIL. Tenders by April 24.

### General Stores—Castings, Iron and Steel, Bolts, &c., Tools, Ironmongery, Cock Fittings, Oils and Paints, Brass and Copper Tubes and Fittings, Lead Gas Pipe, &c., &c.

EDINBURGH AND LEITH GAS COMMISSIONERS. Tenders by April 12.
WIGAN GAS DEPARTMENT. Tenders by April 19.

### Governor.

CLEATOR MOOR URBAN DISTRICT COUNCIL. Tenders by April 24.

### Meters.

EDINBURGH AND LEITH GAS COMMISSIONERS. Tenders by April 12.

### Oil for Gas Making.

EDINBURGH AND LEITH GAS COMMISSIONERS. Tenders by April 12.

### Oxide of Iron.

EDINBURGH AND LEITH GAS COMMISSIONERS. Tenders by April 12.

### Pipes and Fittings, &c.

CLEATOR MOOR URBAN DISTRICT COUNCIL. Tenders by April 24.
EDINBURGH AND LEITH GAS COMMISSIONERS. Tenders by April 12.
WIGAN GAS DEPARTMENT. Tenders by April 19.

### Purifiers, &c.

CLEATOR MOOR URBAN DISTRICT COUNCIL. Tenders by April 24.

### Residual Products for Sale and Residual Products Works to Lease.

GLASGOW GAS DEPARTMENT. Tenders by April 20.

### Stoves.

EDINBURGH AND LEITH GAS COMMISSIONERS. Tenders by April 12.

### Sulphuric Acid.

WIGAN GAS DEPARTMENT. Tenders by April 19.

### Tar and Liquor.

EDINBURGH AND LEITH GAS COMMISSIONERS. Tenders by April 12.
WIGAN GAS DEPARTMENT. Tenders by April 19.

## GAS COMPANIES' STOCK AND SHARE LIST.

Referred to on p. 19.

| Issue | Share. | When ex-Dividend. | Dividend or Dividend & Bonus | NAME. | Closing Prices. | Rise or Fall in Wk. | Yield upon Investment. |
|---|---|---|---|---|---|---|---|
| £ | | | p.c. | | | | £ s. d. |
| 590,000 | 10 | Oct. 15 | 10 | Alliance & Dublin 10 p.c. | 18¼—19 | .. | 5 5 3 |
| 298,955 | 10 | ,, | 7 | Do. 7 p.c. | 12⅞—13¼ | .. | 5 5 8 |
| 310,000 | Stk. | Jan. 14 | 4 | Do. 4 p.c. Deb. | 94—100 | .. | 4 0 0 |
| 200,000 | 5 | Oct. 29 | 6⅓ | Bombay, Ltd. | 5⅞—5⅞ | .. | 5 10 8 |
| 40,003 | 5 | ,, | 6⅓ | Do. New, £4 paid | 4⅜—4⅜ | .. | 5 18 11 |
| 50,000 | 10 | Feb. 25 | 24 | Bourne- } 0 p.c. | 25¼—29¼ | .. | 4 14 11 |
| 51,810 | 10 | ,, | 7 | mouth Gas } B 7 p.c. | 16¼—16¾ | .. | 4 3 7 |
| 53,200 | 10 | ,, | 6 | and Water } Pref. 6 p.c. | 15⅜—16 | .. | 3 15 0 |
| 380,000 | Stk. | ,, | 12½ | Brentford Consolidated | 245—248 | .. | 5 0 10 |
| 300,000 | ,, | ,, | 5⅓ | Do. New | 185—188 | .. | 5 1 1 |
| 50,000 | ,, | ,, | 5 | Do. 5 p.c. Pref. | 120—122 | .. | 4 2 0 |
| 206,250 | ,, | Dec. 11 | 4 | Do. 4 p.c. Deb. | 101—103 | .. | 3 17 8 |
| 220,000 | Stk. | Mar. 12 | 10⅔ | Brighton & Hove Orig. | 203—212 | .. | 5 1 5 |
| 246,320 | ,, | ,, | 7⅓ | Do. A Ord. Stk. | 150—153 | .. | 5 1 4 |
| 467,000 | 20 | Oct. 15 | 10 | British | 42—43 | .. | 4 13 0 |
| 109,030 | Stk. | Feb. 25 | 6 | Bromley, Ord. 5 p.c. | 114—117 | .. | 5 2 7 |
| 165,700 | ,, | ,, | 4⅓ | Do. do. 3½ p.c. | 85—87 | .. | 5 3 6 |
| 500,000 | 10 | Oct. 15 | 7 | Buenos Ayres (New) Ltd. | 12⅝—13¼ | .. | 5 5 8 |
| 250,000 | Stk. | Dec. 11 | 4 | Do. 4 p.c. Deb. | 94—96 | .. | 4 3 4 |
| 100,000 | 10 | — | — | Cape Town & Dis., Ltd. | 4⅜—5⅛ | .. | — |
| 100,000 | 10 | — | — | Do. 4½ p.c. Pref. | 4⅜—5⅛ | .. | — |
| 50,000 | 50 | Nov. 3 | 6 | Do. 6 p.c. 1st Mort. | 47—49 | .. | 6 2 5 |
| 100,000 | Stk. | Dec. 30 | 4½ | Do. 4½ p.c. Deb. Stk. | 73—78 | .. | 5 15 5 |
| 157 150 | Stk. | Feb. 25 | 5 | Chester 5 p.c. Ord. | 109—111 | .. | 4 10 1 |
| 1,491,280 | Stk. | Mar. 12 | 5 5/10 | Commercial 4 p.c. Stk. | 106—108 | .. | 4 16 4 |
| 560,000 | ,, | ,, | 5 | Do. 3½ p.c. do. | 101—103 | .. | 4 17 1 |
| 475,000 | ,, | Dec. 11 | 3 | Do. 3 p.c. Deb. Stk. | 81—83 | .. | 3 12 3 |
| 800,000 | Stk. | ,, | 6½ | Continental Union, Ltd. | 101—103 | .. | 6 6 3 |
| 200,000 | ,, | ,, | 7 | Do. 7 p.c. Pref. | 138—141 | .. | 4 19 3 |
| 491,270 | Stk. | — | 5 | Derby Con. Stk. | 121—123 | .. | 4 1 4 |
| 55,300 | ,, | — | 4 | Do. Deb. Stk. | 103—105 | .. | 3 16 2 |
| 145,995 | ,, | Mar. 31 | 5 | East Hull 5 p.c. Ord. | 96—98* | +½ | 5 2 0 |
| 486,090 | 10 | Jan. 28 | 12 | European, Ltd. | 23⅞—24½ | .. | 4 19 0 |
| 354,060 | 10 | ,, | 12 | Do. £7 10s. paid. | 17⅞—18½ | .. | 4 18 5 |
| 15,161,545 | Stk. | Feb. 11 | 4/10/8 | Gas } 4 p.c. Ord. | 102—103 | +2½ | 4 7 11 |
| 2,620,000 | ,, | ,, | 3⅜ | light } 3½ p.c. max. | 88—89 | .. | 3 18 8 |
| 3,799,735 | ,, | ,, | 4 | and } 4 p.c. Con. Pref. | 104—106 | .. | 3 15 6 |
| 4,193,975 | ,, | Dec. 11 | 3 | Coke } 3 p.c. Con. Deb. | 85—86 | +½ | 3 9 9 |
| 258,740 | Stk. | Mar. 12 | 4⅜ | Hastings & St. L. 3½ p.c. | 93—95 | .. | 5 0 0 |
| 82,530 | ,, | ,, | 6¼ | Do. do. 5 p.c. | 110—112 | .. | 5 11 7 |
| 70,000 | 10 | Oct. 15 | 11 | Hongkong & China. Ltd. | 18—18½ | .. | 5 18 11 |
| 123,500 | Stk. | Mar. 12 | 6½ | Ilford "A" and "C" | 134—136 | +3 | 4 15 7 |
| 65,780 | ,, | ,, | 5 | Do. "B" | 103—105 | +1 | 4 15 3 |
| 51,000 | ,, | Dec. 30 | 4 | Do. 4 p.c. Deb. | 102—104 | .. | 3 16 11 |
| 4,940,000 | Stk. | Nov. 13 | 8 | Imperial Continental | 182—184 | .. | 4 7 0 |
| 473,600 | Stk. | Feb. 11 | 3½ | Do. 3½ p.c. Deb. Red. | 94—96 | .. | 3 12 11 |
| 195,242 | Stk. | Mar. 12 | 6 | Lea Bridge Ord. 5 p.c. | 117—119 | .. | 5 0 10 |
| 561,000 | Stk | Feb. 25 | 10 | Liverpool United A | 222½—224½ | .. | 4 9 1 |
| 718,100 | ,, | ,, | 7 | Do. B | 169½—171½ | .. | 4 1 7 |
| 306,083 | ,, | Dec. 30 | 4 | Do. Deb. Stk. | 105—107 | .. | 3 14 9 |
| 75,000 | 5 | Dec. 11 | 6 | Malta & Mediterranean. | 4⅝—5 | .. | 6 0 0 |
| 520,000 | 100 | Apl. 1 | 5 | Met of } 5 p.c. Deb. | 100—102* | +1⅛ | 4 18 0 |
| 250,000 | 100 | ,, | 4½ | Melbourne } 4½ p.c. Deb. | 100—102* | +1⅛ | 4 8 3 |
| 541,920 | 20 | Nov. 13 | 3½ | Monte Video Ltd. | 12½—12⅝ | .. | 5 9 10 |
| 1,775 892 | Stk. | Feb. 25 | 4½ | Newc'tle & G'tesh'd Con | 107—108 | .. | 4 3 4 |
| 518,795 | Stk | Dec. 30 | 3½ | Do. 3½ p.c. Deb. | 91—93 | .. | 3 15 3 |
| 15,000 | 10 | Feb. 25 | 10 | North Middlesex 10 p.c. | 19⅜—20 | .. | 5 0 0 |
| 55,940 | 10 | ,, | 7 | Do. 7 p.c. | 13—13⅓ | .. | 5 3 8 |
| 302,000 | Stk. | Nov. 27 | 8 | Oriental, Ltd. | 140—142 | .. | 5 12 8 |
| 60,000 | 5 | Mar. 31 | 8 | Ottoman, Ltd. | 6—6⅛ | .. | 6 8 0 |
| 31,830 | 53 | Feb. 25 | 13 | Portsea Island A. | 135—137 | .. | 5 0 7 |
| 60,000 | 50 | ,, | 13 | Do. B. | 129—131 | .. | 4 19 3 |
| 100,000 | 50 | ,, | 12 | Do. C. | 119—121 | .. | 4 19 2 |
| 114,800 | 50 | ,, | 10 | Do. D and E. | 101—103 | .. | 4 17 1 |
| 398,490 | 5 | Oct. 29 | 7 | Primitiva Ord. | 6⅛—6⅜ | +⅛ | 5 7 8 |
| 796,183 | 5 | Jan. 28 | 5 | Do. 5 p.c Pref. | 5—5⅛ | .. | 4 15 3 |
| 485,900 | 100 | Dec. 1 | 4 | Do. 4 p.c. Deb. | 95—97 | .. | 4 2 6 |
| 1,400,000 | 10 | Oct. 15 | 6 | River Plate Ord. | 13⅞—14⅛ | ⅝ | 5 12 3 |
| 312,650 | Stk | Dec. 30 | 4 | Do. 4 p.c. Deb. | 95—97 | .. | 4 2 6 |
| 250,000 | 10 | Mar. 31 | 8 | San Paulo, Ltd. | 13⅜—14⅝ | .. | 5 14 4 |
| 62,500 | 10 | ,, | — | Do 6 p.c. Pref. | 11⅜—12* | +⅛ | 5 0 0 |
| 125,000 | 50 | Jan. 2 | 5 | Do. 5 p.c. Deb. | 49⅞—50⅜ | .. | 4 19 0 |
| 135,000 | Stk. | Mar. 12 | 10 | Sheffield A | 236—238 | .. | 4 4 0 |
| 209,981 | ,, | ,, | 10 | Do. B | 236—238 | .. | 4 4 0 |
| 523,500 | ,, | ,, | 10 | Do. C | 234—236 | .. | 4 4 9 |
| 70,000 | 10 | Oct. 29 | 10 | South Africa | 13⅜—14⅛ | +⅛ | 7 0 4 |
| 6,429,895 | Stk. | Feb. 11 | 5/6/8 | South Met., 4 p.c. Ord. | 121—123 | +1 | 4 6 8 |
| 1,895,445 | ,, | Jan 14 | 3 | Do. 3 p.c. Deb. | 85—86 | +⅛ | 3 9 9 |
| 209,820 | Stk. | Mar. 12 | 8 | South Shields Con. Stk. | 152—154 | .. | 5 3 11 |
| 605,000 | Stk. | Feb. 25 | 5⅛ | S'th Suburb'n Ord. 5 p.c. | 120—122 | +1 | 4 10 2 |
| 60,000 | ,, | ,, | 5 | Do. 5 p.c. Pref. | 120—122 | .. | 4 2 0 |
| 117,058 | ,, | Jan. 14 | 5 | Do. 5 p.c. Deb. Stk. | 124—126 | .. | 3 19 4 |
| 502,310 | Stk. | Nov. 13 | 5 | Southampton Ord. | 109—111 | .. | 4 10 1 |
| 120,000 | Stk. | Feb. 25 | 6⅔ | Tottenham } A 5 p.c. | 132—134 | +1 | 5 0 9 |
| 423,940 | ,, | ,, | 5¼ | and } B 3½ p.c. | 169—111 | +1 | 4 14 7 |
| 149,470 | ,, | Dec. 30 | 4 | Edmonton } 4 p.c. Deb. | 101—103 | +1 | 3 17 8 |
| 182,380 | 10 | ,, | 8 | Tuscan, Ltd. | 8¾—9¼ | .. | 8 13 0 |
| 149,900 | 10 | Jan. ,, | 5 | Do. 5 p.c. Deb. Red. | 99—101 | .. | 4 19 0 |
| 236,476 | Stk. | Feb. 25 | 5 | Tynemouth, 5 p.c. max. | 105—107 | .. | 4 13 6 |
| 255,636 | Stk. | Feb. 25 | 6½ | Wands- } B 3½ p.c. | 131—133 | .. | 4 17 9 |
| 79,416 | ,, | Dec. 30 | 3 | worth } 3 p.c. Deb. Stk. | 72—74 | .. | 4 1 1 |
| 835,872 | ,, | Feb. 25 | 5½ | West Ham 5 p.c. Ord. | 117—120 | +½ | 4 7 6 |
| 210,000 | ,, | ,, | 5 | Do. 5 p.c. Pref. | 124—126 | .. | 3 19 4 |
| 253,300 | ,, | Dec. 30 | 4 | Do. 4 p.c. Deb. Stk. | 105—107 | .. | 3 14 9 |

Prices marked * are "Ex div."

# NOTICES TO CORRESPONDENTS, ADVERTISERS, AND SUBSCRIBERS.

*No notice can be taken of anonymous communications. Whatever is intended for insertion in the "JOURNAL" must be authenticated by the name and address of the writer; not necessarily for publication, but as a proof of good faith.*

## EASTER HOLIDAYS.

**In consequence of the EASTER HOLIDAYS, all Communications for the next issue of the "JOURNAL" and Orders respecting ADVERTISEMENTS should be received at the Office NOT LATER than the FIRST POST ON SATURDAY.**

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See Advertisement on p. 56.
FRIEDRICH LUX, LUDWIGSHAFEN-AM-RHEIN.

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